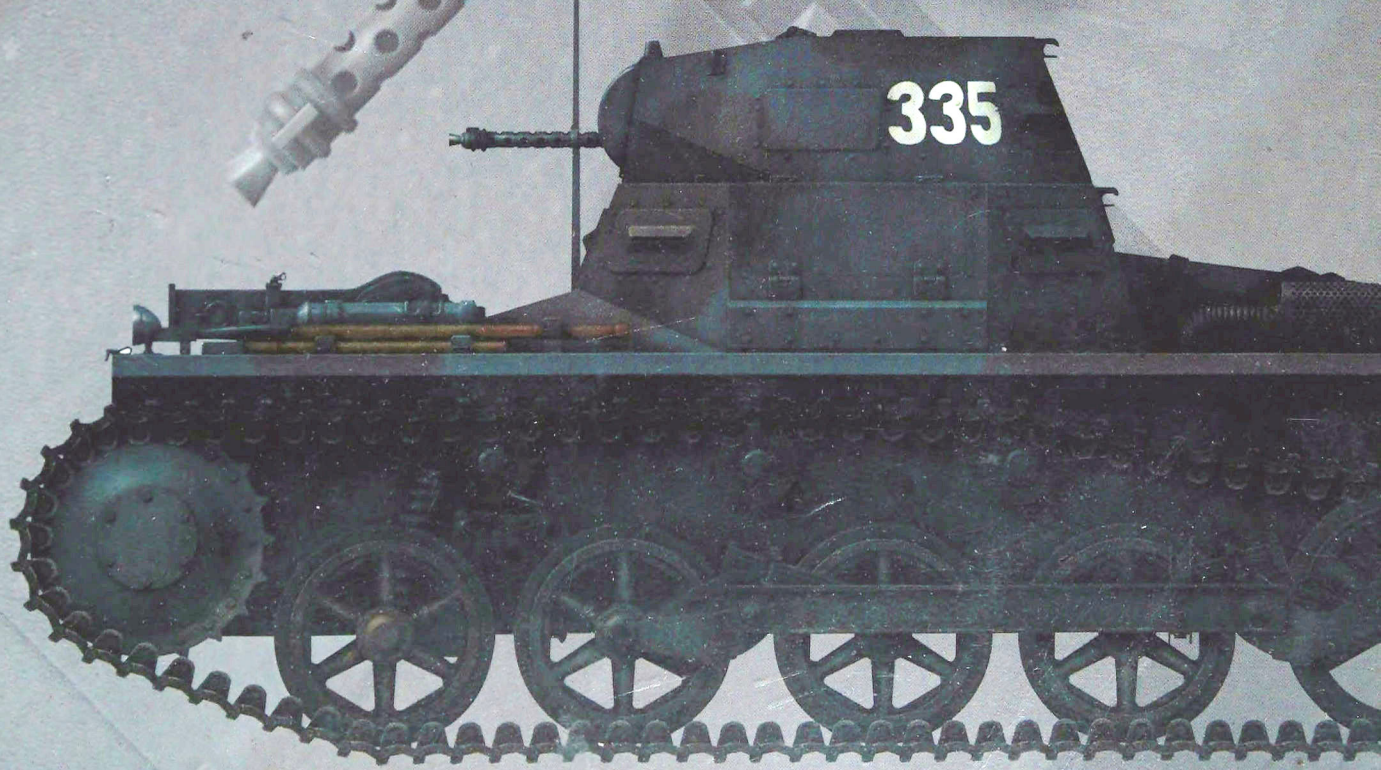
Panzerwaffe

VOLUME ONE

The Evolution of the Panzerwaffe to the Fall of Poland 1939

Rainer Strasheim
John Prigent
Carlos Caballero Jurado
Lucas Molina Franco
William Russ



Series Editor: John Prigent

THE AUTHORS

John Prigent has been interested in tanks and tank warfare from a very early age. Some of his colour photographs of exhibits at The Tank Museum, Bovington, in the 1950s have been used by the Museum to repaint tanks in their original colours. He is a retired Company Secretary and a Fellow of a professional Institute. His interests include voracious reading, research into tanks and tank warfare, collecting photographs of inter-war and early World War Two tanks, model-making and gardening. He is a member of AMPS and IPMS, serves as the competition judge for his local model society, and is a retired Armour Classes judge at Euromilitaire.

His published books include *Armour Modelling* (Osprey Publishing) and *Warrior Mechanised Combat Vehicle* and *Scorpion, Scimitar and Sabre* (Darlington Press) and he is the author of many magazine articles on modelling and AFVs. He also acts as a technical proofreader for several publishers of books about tanks and armoured vehicles.

Rainer Strasheim was born in 1953, and works as a military and civil engineer with the German Armed Forces. He is married, with two sons and lives in Minden. He takes a keen interest in the history of the Great War and specifically in German armour and assault troops, and is a recognised authority in these fields.

Carlos Caballero Jurado was born in Ciudad Real (Spain) in 1957. He has written around twenty books and many articles on military history. Several of his works have been translated into English, Italian, German and Russian. He teaches history and belongs to the Volunteer Reserve of the Spanish Army as a 2nd Lieutenant.

Lucas Molina Franco is a graduate in Business Management and Economics and a candidate for a doctorate in History at Valladolid University. He has written many books and articles on military history including *Von Thoma's Men; The German Army in the Spanish Civil War, 1936-1939'; Panzer I – The Birth of a Saga* and *Panzer IV – The Wehrmacht's Fist.* He is currently researching the history of the anti-aircraft battalion of the *Legion Condor* (F/88) and conducting a wide study on the acquisition of military and industrial hardware by Franco's Spain from Hitler's Germany.

William Russ is a keen student of military history, particulary of the Second World War and the Napoleonic era, though he also has interests in space exploration, archeology and other science related areas. He lives in Lexington, South Carolina, and although he has worked for the South Carolina Department of Transportation for many years, he is due to retire in July 2008 when he plans to write more books. His published work includes *Case White: The German Army in the Polish Campaign, September 1939.*

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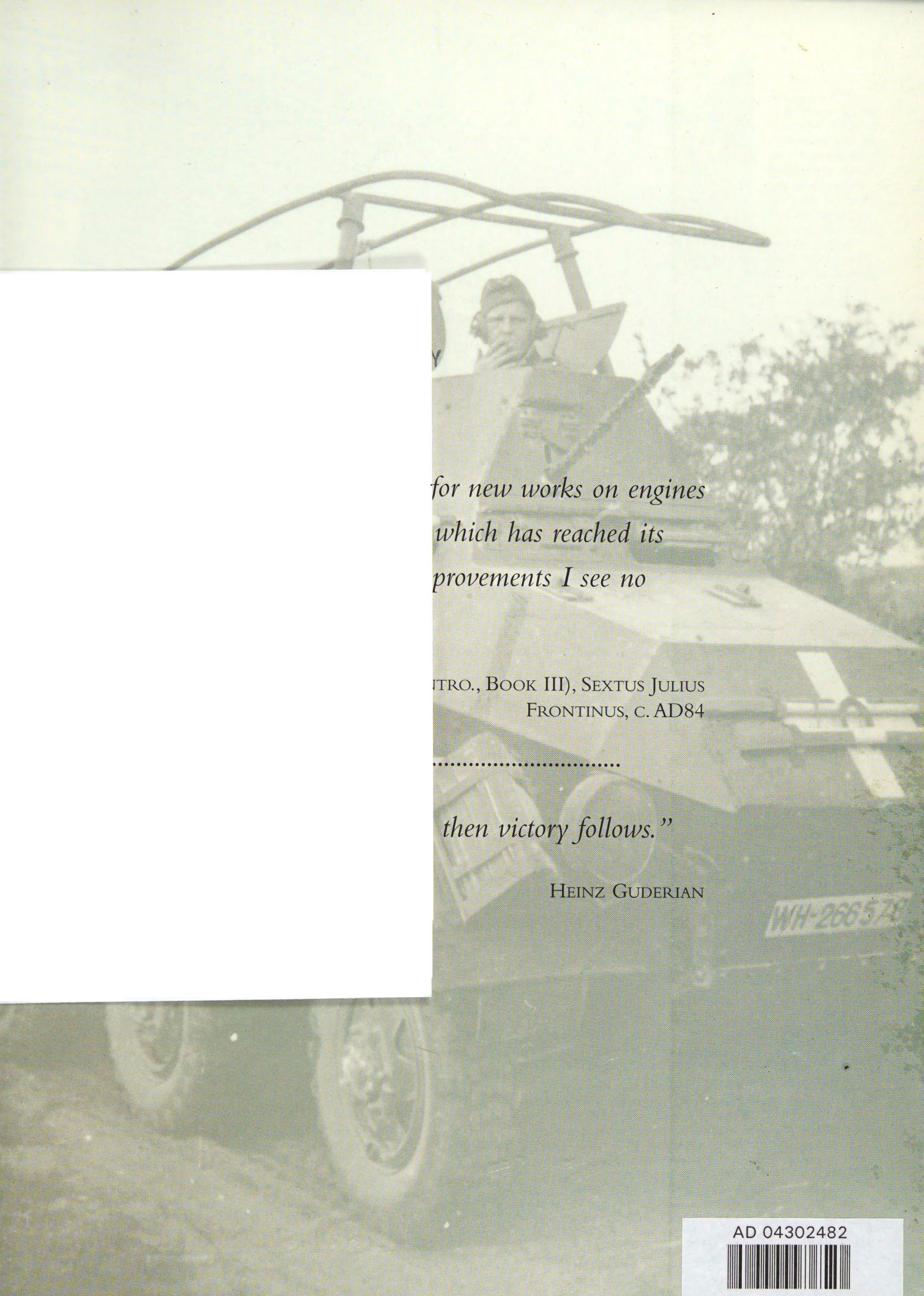

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Introduction

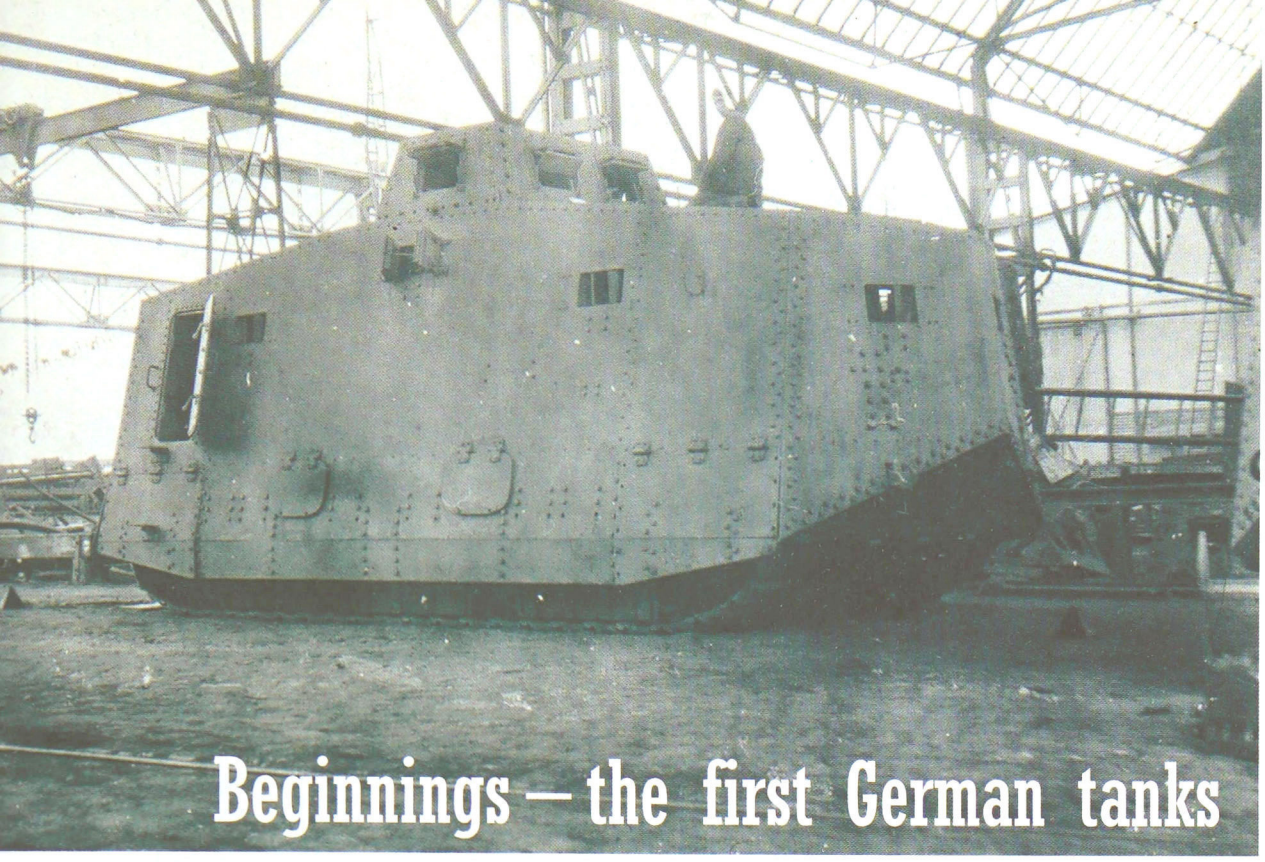
This is the first book of a series detailing the history of the *Panzerwaffe* from the first German tanks in World War One to the end of World War Two. It is planned that each period or campaign will be described by a commisioned author with key knowledge of the subject, but this first book is very much a team effort and our thanks go to all those who contributed.

This is not just another book of photographs. Our intention is to include a comprehensive text for each book in the series – not just a brief summary on a few pages as in some other books. We have included as many previously unpublished photographs as possible to show the *Panzerwaffe's* equipment in use.

Although the emphasis will be on tanks, we will also be covering the Panzer Divisions as the combined-arms units that they were, so all their integral armoured vehicles will be covered – armoured cars, self-propelled artillery and anti-tank guns on tank chassis, and armoured halftracks as well as tanks.

Special thanks go to Thomas Jentz and Hilary Louis Doyle of Panzer Tracts for their help in providing the scale plans that have been used as a basis for the colour plates in this book.
Readers wanting more information about the vehicles described here will find Ian Allan's separate series of books about tanks useful, and those wanting even more technical details will find the *Panzer Tracts* books essential – information about these can be found at www.panzertracts1.tripod.com

John Prigent
Series Editor



501, the first A7V tank to become ready, seen in the work yard of Steffens & Noelle's late in 1917. 501 was the only A7V to be fielded as a female (machine gun armed only) tank and remained so until mid-1918, when a socle mounted gun was finally installed. Because the Germans refrained from using scarce nickel, chrome or manganese to harden tank armour, their armour plates had to be thicker, thus increasing the weight of the tanks, and in the case of the A7V, further reducing cross-country performance. In this picture the covers for the towing hooks are being attached. (Mario Doherr Collection)

Beginnings – the first German tanks

by Rainer Strasheim

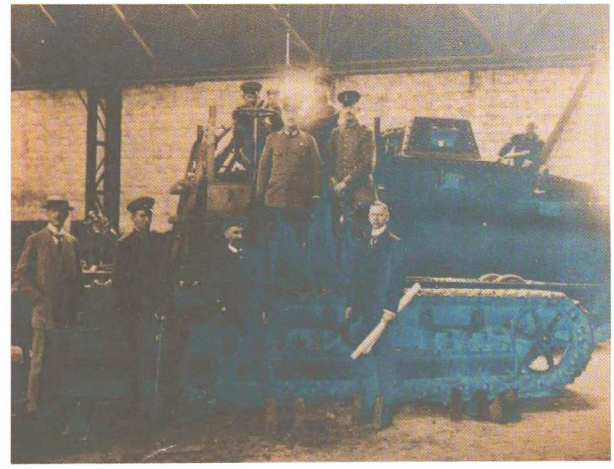
THE TANK was created by the western Entente powers during the Great War. In another – ultimately successful – attempt to overcome the Western Front stalemate, Britain fielded the first combat tanks and produced those machines best adopted to trench warfare landscapes, the rhomboids of the Mk.I to Mk.V series, while France eventually developed and mass-produced the first tank with a 'modern' layout, the Renault FT17.

The Central Powers, and Germany in particular, are usually described as only adopting this new means of warfare reluctantly and too late. Certainly there was no arms race to produce the first armoured all-terrain fighting vehicle. The Germans merely reacted to the appearance of the first tanks at the Somme in September 1916. This reaction occurred with remarkable swiftness, but did not result in a powerful German tank force. Only 20 vehicles of the indigenous A7V model and a total, over time, of perhaps 90 captured British Mk.IVs formed the rather modest German tank arm. Furthermore, the A7V is usually described as clumsy and inferior in published opinion, thus adding to the impression that the German tank effort was only third class.

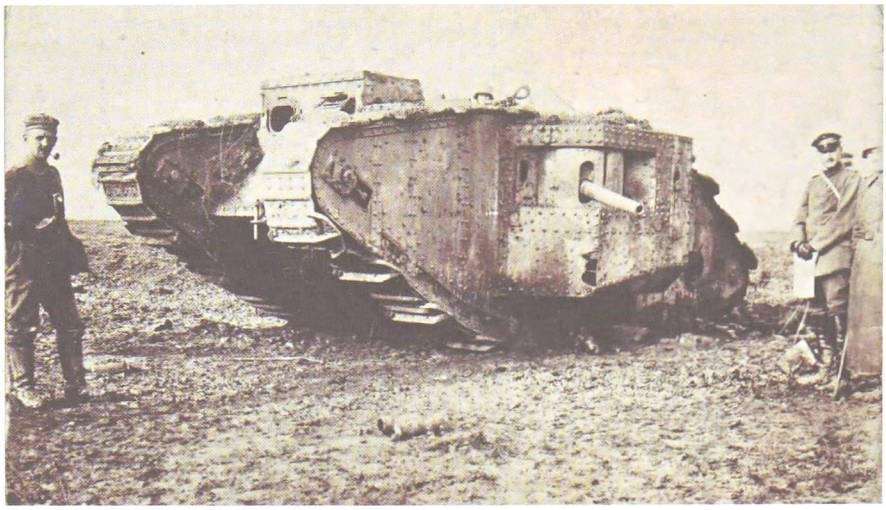
The problem for the German High Command (*Oberste Heeresleitung* – OHL) was to determine whether tanks really deserved the expending of considerable resources, which were not freely available in beleaguered and blockaded Germany. In other words: Was the tank a decisive weapon? Could it become a decisive weapon?

The debut of '*armed and armoured English motor vehicles*' at the Somme had been alarming but not decisive. Individual machines had stunned the defenders, rendering their machine guns useless, but the general effect of the few '*monsters*' had been negligible. Nevertheless, here was a new weapon that had to be explored. In short order, a German tank construction programme was organised – which eventually led to the commission of the A7V tank.

But uncertainties soon arose. By incredible chance, it was not the A7V prototype that was first presented to the decision makers on 11 March 1917 but an awkwardly unfit vehicle, the '*Bremer-Wagen*'. Then, near Arras, another unbelievable event occurred: the combat use of British Mk.II training tanks with unhardened steel plates. On 11 April 1917, twelve British tanks attacked at Bullecourt, nine of which were put out of action by the defenders, and one, a Mk.II male (No. 799), stranded well behind the first German trench line. When tested, its flank was



The armoured hulls of the A7Vs were cut, drilled, assembled and fixed at Steffens & Noelle's, located at Berlin-Tempelhof, a bridge building and steel mast construction company. The man in the centre, standing on the right-hand side of the steering wheel, is Joseph Vollmer, the chief designer of the A7V and LK tanks. The A7V was his first experience in tank construction. Realising that the A7Vs were far too complex and consumed too many resources, Vollmer had already turned his attention to light tanks in the early summer of 1917. But his initial, resource oriented, plan to use the chassis and engines of available passenger cars as the basis for the LKs prevented a clean cut solution suitable for fast mass production. (Strasheim Collection)



Mk.II 799 with new owners. Within a few days after the events of 11 April, the German XIV. Reserve Corps, in charge of the Bullecourt sector, distributed a 'Tank Report' providing pictures and appraisals. Combat experience and subsequent trials led to the impression that steel core bullets were an effective remedy against tanks. The Germans remained unaware that the Mk.II tanks had only been built as unarmoured training machines. Because Mk.I battle tanks were in short supply, some Mk IIs had been pressed into combat service at Arras – over the shrill protests of the British tank personnel. (Strasheim Collection)

easily penetrated by the new steel core machine gun bullets at 150 metres distance, the projectiles also igniting the tank's fuel supply. It was realised that there was a cheap weapon that could effectively end the tank menace!

Next came the first French tank attack on 16 April 1917, a bloody débâcle – for the French. After these events, *General* Erich Ludendorff, the driving spirit of the German Army, decided that tanks would not become a decisive weapon and did not deserve the use of precious resources. (The floundering of the British tank fleet in the Flanders mud during summer and autumn 1917 did nothing to reverse this perception.) In consequence, the German tank programme lost momentum and did not show results... Dubious new projects like the colossal *K-Wagen* and the overweight A7V-U popped up – and never made it beyond prototypes.

Then, on 20 November 1917, hundreds of British tanks suddenly smashed some eight kilometres through the *Siegfried-Stellung* (known as the Hindenburg-Line to the British) in front of Cambrai. No breakthrough occurred because the amazing success of this mass tank attack surprised the British commanders as much as their German opponents, and eventually a counter-attack regained most of the terrain, but for a number of days the situation looked rather bleak. This changed Ludendorff's opinion considerably – but now it was too late. Whatever could be started at this point would not arrive in time for the big push in spring, when Germany aimed to achieve victory in the west. Moreover, German tactics had so far evolved without regard to tanks throughout 1917 and the regulations for attack in positional warfare ('*Die Angriffsschlacht im Stellungskrieg*') and for general infantry training ('*Ausbildungsvorschrift der Fußtruppen*'

While F.41 'Fray Bentos', a male Mk.IV, (on its way to Berlin) was probably demonstrated to OHL officers at Bad Kreuznach on 19 December 1917, the female F.13 'Falcon II' was presented to Kaiser Wilhelm II at Le Cateau on 23 December. Tank and Emperor are seen here in front of Palais Fénelon. A contemporary report describes F.13 as 'a grey hump'. The colours of its camouflage net are described correctly as 'brown netting with green cloth flaps'. Being a replacement vehicle, Falcon II was perhaps rushed into service at Cambrai in the dark grey factory finish without receiving a coat of chocolate brown, the normal hue of British tanks since early 1917. Both F.13 and F.41 are prominent in the movie 'Die Englischen Tanks bei Cambrai' that was shown in German cinemas starting January 1918. (Strasheim Collection)

The most dangerous enemy of the captured tank was the German soldier armed with screwdriver, wrench and tongs. Constant guarding was necessary to prevent precious parts from being 'found' and presented to some booty collection officer for prize money. In this picture, taken most probably in spring of 1918, all gun apertures have been provisionally closed to facilitate control. A number of harsh orders were issued by OHL and Chefkraft in order to protect captured tanks from being disassembled by their own troops. (Strasheim Collection)

While Tank 506 is waiting for recovery (note the tank commander, Lt Voss, with binoculars, standing near the rear door), the inspection group is engaged in heated discussions. Chefkraft was accompanied not only by a whole echelon of personnel from the home agencies, but also by numerous motor transport field officers. Joseph Vollmer had already been with Abt. 1 since 27 January, trying to make his tanks work. On the second day of the inspection, only two tanks, 505 and 506, were still serviceable. 540 was disabled by a broken fuel pipe. (Strasheim Collection)

– A.V.F.) were now being finalised and would be the most important manuals used in training for the March offensive.

Nevertheless, tank building now became a top priority task. For the utilisation of those tanks captured at Cambrai (about 100 had been counted, with 30 readily recoverable) a Bavarian army motor transport depot (*Bayerischer Armee-Kraftwagen-Park* 20 – B.A.K.P. 20) was transferred to Monceau-sur-Sambre near Charleroi in Belgium to become the central workshop of the German tank force.

After the 1918 German spring offensive, some 300 more derelict British tanks would be captured around Bapaume, Peronne, and Bray-sur-Somme.

Learning lessons from the British massed tank assault, the Chief of Field Motor Transportation (*Chef des Feldkraftfahrwesens*, in short *Chefkraft*), *Oberst* Hermann Meyer, proposed in late December 1917, the construction of light tanks suitable for rapid mass production. This proposal was rejected by OHL because the projected vehicle (*Leichter Kampfwagen* – LK) did not even offer protection against ordinary rifle bullets. Yet the light tank idea had been placed and – development never stopping – the next proposal, to become the LK.II, would follow soon. (Initial planning had already begun in mid-1917, the LK thus was a genuine German product, not a mere reaction to the British Medium A 'Whippet' or the Renault FT17.)

The question remained of what to do with the A7Vs. Only 20 tanks were actually under construction but after Cambrai the intended numbers grew erratically, alternating between a total of 32, 36 and 38 – and finally increased to a maximum of 68 with 10 detachments envisaged of five tanks each (the remaining vehicles forming the reserve pool).

The original arrangement had foreseen detachments of five tanks, thereof four machine gun armed ('females', to use the British jargon) and only one with a cannon (thus a 'male'). Now all A7Vs were to receive a cannon to create sufficient anti-tank capability, should the enemy try something in the Cambrai style again. This required some critical rearrangements, and eventually only four of the five tanks of *Abteilung 1* carried a gun when the detachment arrived for evaluation at the *Führer- und Generalstabs-Kursus* (leaders- and general staff training course) near Sedan/France on 12 January 1918.

The assessment at Sedan soon revealed major complications! Grave doubts arose whether the A7V was usable in warfare at all. Tanks and crews were evaluated as 'Not combat ready'. While the engineers rushed to Sedan to deal with the technical side, Crown Prince Wilhelm proposed to hand the detachment over to *Sturmbataillon No.5* (*Rohr*) at Beuveille for enhanced training.

Abteilung 1 arrived at Beuveille on 26 January. On 1 and 2 February they were inspected by *Chefkraft*, *Obst.* Meyer. Meyer already had serious reservations regarding the A7V. He knew about its weak points: the 'low nose', insufficient ground clearance, weak frame, and soft underbelly – all leading to a vehicle not apt for crossing Western Front trenches and moving through heavily shelled terrain. And what he now saw and heard during the inspection convinced him that the A7V was not at all reliable enough to serve as a combat vehicle. (Meyer's preferred idea – after rejection of his initial light tank proposal – became to copy and improve the British rhomboid design, which had proven so optimal for Western Front conditions in 1916 and 1917. This idea led to some intensive planning and scheming but was finally dropped in favour of LK production.)

Abt. 1 stands ready for inspection by Chefkraft at the 'Tank Square' of the Doncourt training area on 1 February, 1918. The tanks are from left to right: 505 (Oblt. Seifert, the detachment CO), 506 (Lt Voss) and 540 (Lt Bartens). All crew members except the latter two commanders wear the field grey tank overalls, the drivers and mechanics with padded leather helmets in lieu of steel helmets. Note that 540 has a male front (i.e. no flap covered machine gun apertures) still without any vision slits. Note also the 'peepholes' above the gun barrels of the tanks. (Mario Doherr Collection)

Meanwhile, training with the assault battalion proceeded. The weapons personnel of *Abteilung 1* (the machine gunners, infantrymen, gunners and engineers) joined the training of the storm troopers. The motor transport men and signallers were still required to overcome the tanks' teething troubles and multiple defects. Although there never were more than three (on the occasion of Meyer's visit) and usually only two tanks operative, the tanks were continually tested to explore their capabilities and shortcomings. A number of improvements were identified and implemented. On 11 February the first refurbished Mk.IV tank arrived for comparison.

In theory all tank detachments were to execute joint training with an assault battalion before they joined combat, but no fixed schedule existed. *Abt. 1* practised with *Sturmbataillon Rohr* up to its first combat mission. In March 1918 Rohr's battalion trained a number of future tank soldiers to be distributed between all detachments. *Abt.*11 and 12 were employed in getting their Mk.IVs ready, so only received some training with *Jäger-Sturmbataillon* 3 in late April. The cadres of Bavarian *Abt. 13* were also sent to Rohr's battalion, but hardly arrived before they were called away to take over their tanks and join the attack on 27 May. The same happened to *Abt. 14* who had not even fired their cannons and machine guns before they went into action on 27 May. Only when they were sent out for tank familiarisation training in August and September of 1918 did the detachments execute regular training with other arms including assault formations and close support batteries.

On 25 February 1918, *General* Ludendorff, officially first assistant to *General* v. Hindenburg, the Chief of General Staff, but factually the master of the German military machine, inspected *Abteilung 1* and *Sturmbataillon Rohr* at the Doncourt training area neighbouring Beuveille. Two A7Vs (Tanks 505 and 506) participated in the exercise simulating an attack. Firing blanks, they breached a wire obstacle, overcame some shell holes, pushed down a brick wall, negotiated a two-metre trench – and both became stuck at the next obstacle: a trench three metres wide. Obviously *General* Ludendorff was not impressed by this performance. His irked attitude towards tanks is quite astounding for a man otherwise open to all new forms of technical development. It appears that after Cambrai he had become well aware that his spring 1917 decision to neglect tank construction had been wrong. But as this could not be corrected, he was now doggedly determined to carry on and win – without tanks. Cambrai had clearly shown him that only the massed use of tanks promised success, but neither sending into battle 50 A7Vs with neglibible trench-crossing capability nor employing a mere 30 captured Mk. IVs could fulfil this criterion. He did not yet realise that his own offensives would end the era of trench warfare, and that in a more fluid situation with battles fought in open countryside the A7V, by virtue of speed, firepower and armour, would be superior to any other current tank design.

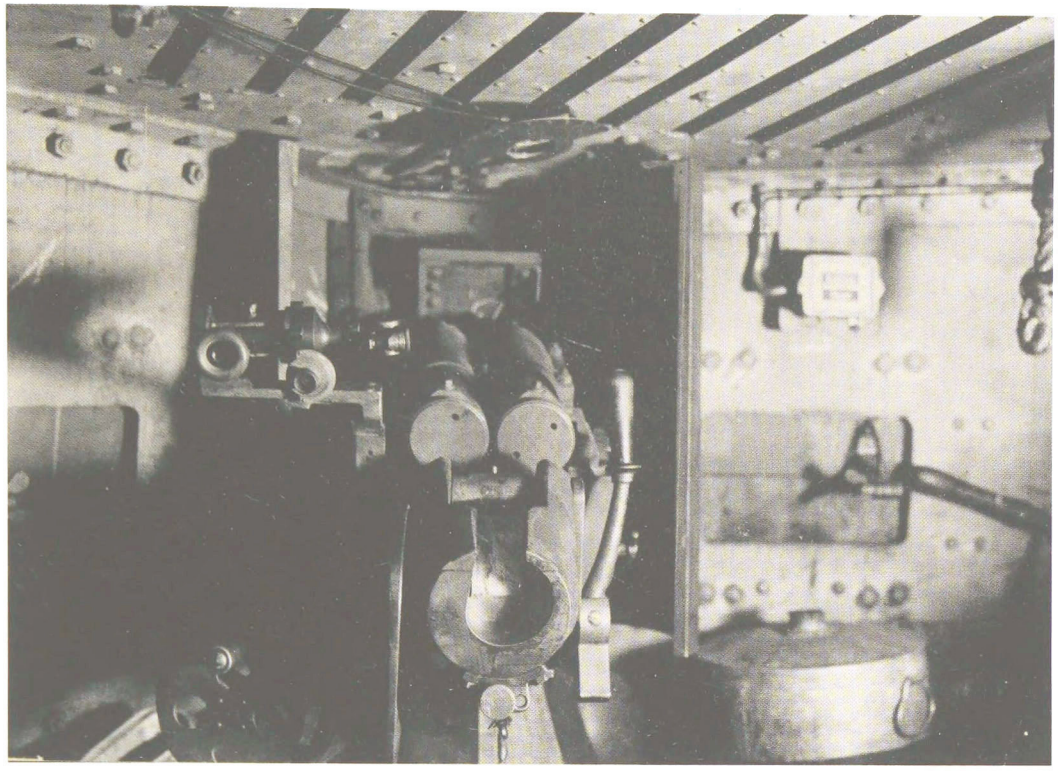
With *Obst.* Meyer's negative assessment and Ludendorff's negative position, the fate of the A7V was sealed: the 20 armoured hulls already procured would be used – all other chassis (in total, 100 had been ordered in early 1917) would be finished as tracked lorries. Thus, even before they had fired their first round in anger, the A7Vs were discarded as fighting vehicles.

Of course, *Chefkraft* Meyer was right, the A7V was no trench-fighting machine, it might even be stopped by an irrigation ditch. Considering the original design task to produce a machine capable of everything the British tanks could do, the A7V was a plain failure. And yes, its mechanical reliability was poor, but that was a fact common to all Great War tanks. Yet Meyer could only judge whether technical specifications were met. As a motor transport specialist he lacked combat experience, and tactical advice on tank operations exceeded his scope.

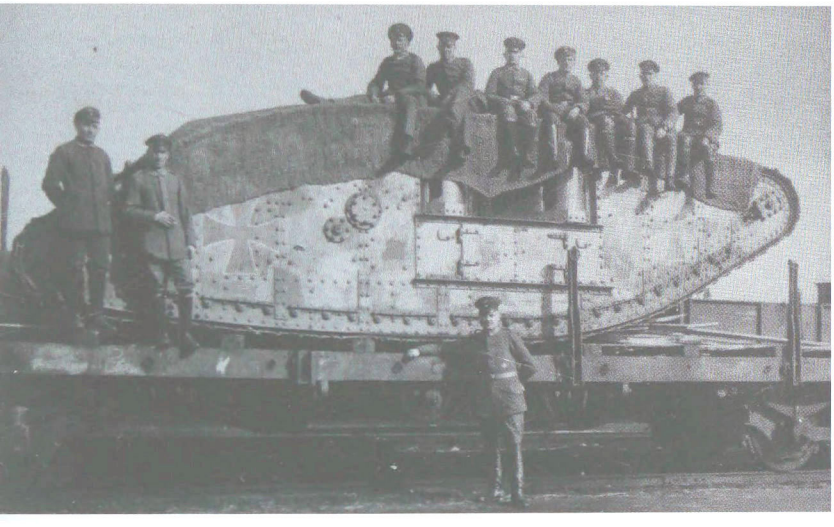
For break-in and fighting through the trench zone the Germans had evolved an all-arms (except tanks) assault, incorporating storm troop, infiltration, and distinctive artillery tactics, which worked well enough under certain conditions - but was no blueprint for breakthrough.

The same was, nevertheless, true for the British rhomboids, which had achieved a remarkable break-in at Cambrai but no breakthrough. They had been built to overcome trenches and churned-up terrain. Once arrived on 'the green fields beyond' it was their turn to become clumsy – slow moving targets for gunnery practice, if not massively protected by friendly artillery and infantry (or by fog), and their sheer number that allowed some vehicles to get through.

Cavalry, the traditional arm for exploitation and pursuit, was out of place in an environment of wire and fire. But here was the A7V, as fast 'as a trotting horse' (to quote an Allied report on a captured machine), with a 12 km/h top speed according to the designing engineers, or 14 km/h as tested out by the crews, running across country still at 6 to 8 km/h. It had a quick-firing 5.7 cm cannon that could penetrate any existing Entente tank armour up to 2,000 metres, and six heavy MG-08 7.92 mm machine guns. Its 30 mm front armour was solid enough to resist a field cannon even at close quarters. The maximum cross-country range was 30 to 35 km. But like all tanks of the era, travelling such an – extraordinary – distance would require intensive repair and overhaul afterward, or even while en route. And the crews would desperately need rest and refit from the intolerable fumes, the infernal heat and the deafening noise inside. If a tank got stuck or went out of order, a crew of 18 to 25 men with one light and six heavy machine guns, plus copious stocks of ammunition, could either form a strong point or go on marauding as an assault party. Eighteen was the minimum crew of an A7V if all stations were to be served. Usually reserve numbers and trainees were carried in addition.



The gun compartment of an A7V showing the direction indicator above the cannon and the fire control box above the right hand aperture. The light signals were: white 'Achtung' (attention); red 'Feuer' (fire); light off meant 'cease firing'. Gun crews were not very happy with the very limited field of vision provided by the telescopic sight of the socle-mounted 5.7 cm cannon because orientation through it was almost impossible in a moving tank. They preferred instead the simple 'peepholes' seen on Tanks 505, 506, 507 and 540, equipped with a buck (trestle) mount for the gun. (Strasheim Collection)



LEFT: One of Abt. 11's tanks seen on a train awaiting transport to St.Quentin. They arrived at Essigny-le-Petit on 17 March 1918. The man with the Iron Cross 1st Class standing in front of the rail wagon is Unteroffizier Fritz Leu, serving as tank driver with Abt. 11. Leu had been instrumental in capturing the first British Mk.IV in drivable condition near Cambrai on 23 November 1917. At least two of the men sitting atop the tank wear the leather-patched trousers of the mountain artillery, also issued to assault troopers and tank crews. If this is the vehicle which Leu drove on 21 March, it is Tank 101 commanded by Lt Werner von Richter. (Strasheim Collection)

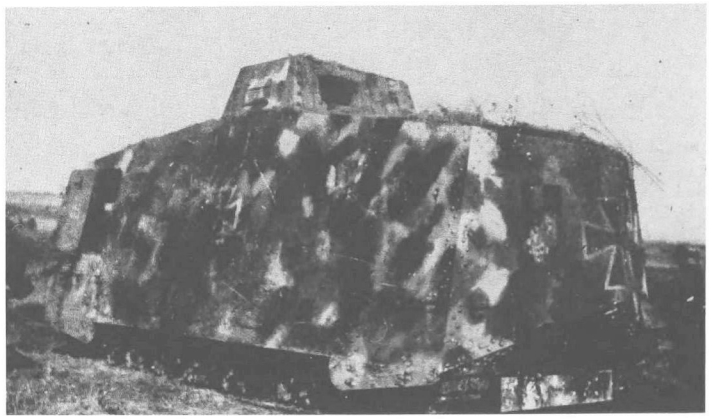
In early 1918 German tactical thinking remained indifferent to tank use. Tanks were a weapon in support of the infantry. They would flatten wire obstacles, advance together with the infantry and subdue any points of resistance that had survived the artillery preparation. They would help repulse enemy counter-attacks. They were not to lead the attack, but might surge ahead to deal with enemy strong points. They might also not accompany the infantry all the time, but stop or retire for technical reasons. In short, the tanks were added to the newly-developed doctrine without much thought about their optimal employment. And the nature of the terrain, not the tactical purpose, decided whether captured Mk.IVs or A7Vs would be used. The possible combination of Mk. IVs for fighting through the trench zone and A7Vs for exploitation was never considered.

In terms of tactical handling, the A7V had quite progressive features. There was a fire control system with coloured lights managed by the tank commander, and a direction indicator, also operated by the commander, for the cannon. This was a far cry from conditions inside the Mk.IVs, which the Germans generally crowded with a crew of twelve (while British Mk.IV crews numbered eight – or even less), where only gestures, hand signs and loud shouts were available for the commander to direct his crew – and he usually had no influence on the aims that his gunners took.

The A7V's signalling lamps were highly appreciated because they could transmit reliably over long distances through the haze of battle. Tests with radio were conducted but produced no workable solution. Runners were routinely employed, carrying a lump hammer to gain access to a tank by pounding a signal on the armour. Carrier pigeons were often used, messenger dogs never. The tanks were also equipped with signalling flags and flares.

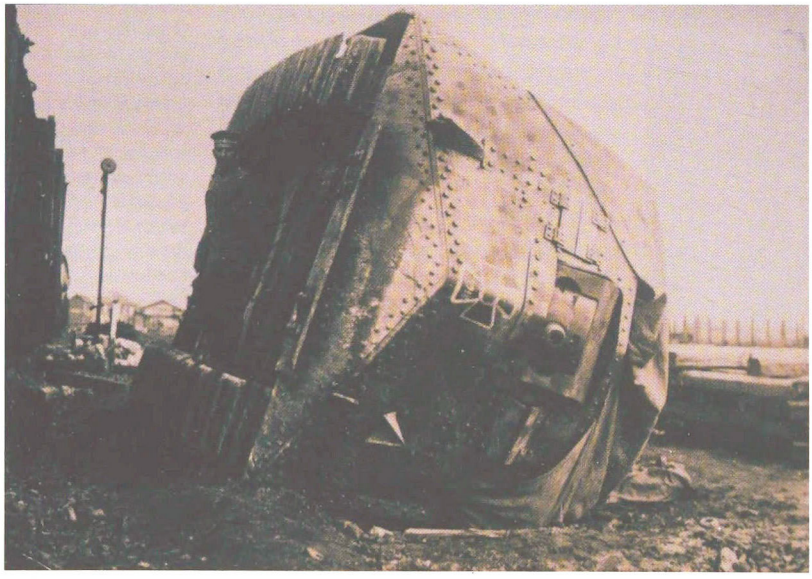
Only one man – the driver – was required to move an A7V around. One of the most popular demonstrations was to have the vehicle rotate several times on the spot, something the Mk.IVs (where four men were required to manage movement) could not do.

Abteilungen 1 and *11* had only an A7V *Überlandwagen* (tracked lorry) each for their first combat mission on 21 March, 'organised' despite the ban on using *Überlandwagens* as recovery vehicles. In all later actions the *Abteilungen* just left immobile vehicles behind and salvage was done by the motor transport troops of the



Tank 505 did not get far on 21 March 1918. After running into a wire obstacle, its clutches burnt out and the gear wheels locked. The tank commander, Lt Voss, was wounded. Note the gaudy camouflage scheme and varying-sized Iron Crosses painted by the crew prior to the mission. According to the recollections of a former Abt. 1 member 'all colours available' (at Beuveille) were used for that purpose. As all the machine guns have already been removed from their apertures this picture was taken well after the action. (Strasheim Collection).

Abt. 11 awaits entraining after 21 March. Before the action the tanks had been hidden inside the halls of the artillery workshop at St. Quentin. Note the A7V-Überlandwagen (tracked lorry) commandeered to serve as a recovery and supply vehicle. On 26 March Chefkraft reported that only one machine gun-armed tank each from Abt. 1 and 11 remained operational. The detachments would be withdrawn to Charleroi for repair and be ready again in early April. (Strasheim Collection)



When Abt. 1 entrained at St.Quentin railway station on 27 March 1918, Tank 507 slipped from the rail wagon and fell on its left side. For recovery, Lt Bartens stayed behind at St.Quentin together with Tank 505. Note the obligatory guard. 507 still carries the makeshift markings applied by the crew. Various dots of the camouflage paints are visible on the front armour. (Strasheim Collection)

sector. Not just at Villers-Bretonneux where a British counter-attack regained most of the terrain, but also all through the German retreat that started in July 1918, this lack of organic recovery assets invariably led to the loss of all vehicles that became defective near the front line.

On 8 March *Abteilung 11*, the first of the *Beute-Abteilungen* (captured detachments) became operational. As cannons could still not be used because the telescopic sights were not ready yet, the initial strength comprised five female Mk IVs (Tanks 101 to 105).

On 21 March 1918, at St.Quentin, *Abteilungen 1* (four A7Vs) and *11* (five Mk IVs) participated in the opening German offensive of 1918, '*Unternehmen Michael*'.

Of the four A7Vs, two (Tanks 505 and 507) broke down before they even attained the British trenches, as did the recovery *Überlandwagen*. Because this was partly due to bad visibility in the dense fog, *Hauptmann* Walter Greiff, commander of *Abt. 1*, stopped movement until vision had cleared sufficiently. The two remaining tanks, 501 and 506, were then successfully employed to overcome some British strongpoints that still held out.

The five Mk IVs of *Abt. 11*, led by the commander, *Hauptmann* Adolf R. Koch, in Tank 103, attacked headlong into the dense fog – and all co-ordination between them ceased immediately. The vehicles roamed around – mainly behind the German infantry screen, which rapidly outran them – supporting the

The tactic adopted for the British tanks in response to the German spring offensive has disparagingly been dubbed 'savage rabbit' (keep hidden until rushing upon the enemy). On several occasions, British tanks attacked the advancing German troops after 21 March. Usually these attacks were quickly repulsed by the accompanying batteries of the German field artillery, who – different from defence – found it easy to concentrate their mobile guns against the slow moving rhomboids. Also, the German infantry displayed no 'Tankschreck' (tank horror), but smoothly avoided the machines while covering them with machine gun fire. Those tanks that managed to retire after their 'savage' attacks were in most cases abandoned by their crews (as they could not move fast enough to escape their assailants), 40 of them completely intact (except for the parts that German soldiers passing by could easily remove). B.A.K.P. 20 established special recovery squads at Bapaume, Doingt and Bray-sur-Somme for collection of the vehicles captured after 21 March. (Strasheim Collection)

suppression of isolated enemy positions until they had to refuel. Two of them, Tanks 103 and 104, were damaged by artillery in the lifting fog.

The performance of the Mk IVs on test at Beuveille and in action on 21 March caused *Hauptmann* Willy Rohr to state: *'The captured English vehicles have stood the test worse than the German tanks. Co-operation with the infantry appears to be impossible because of their modest speed.'* This assessment was soon confirmed by *Jäger-Sturmbataillon* 3 who quickly realised that the Mk IVs of Abt. 11 and 12 could not be integrated into infantry assault training.

Already, at Beuveille, Rohr had evaluated the A7Vs and had arrived at a conclusion that was quite different from Meyer's: *'Provided the terrain is carefully reconnoitred and chosen, they can be used with success.'* The next German tank action at Villers-Bretonneux would confirm that the senior tactical authority for evaluation of war material to be added to the German arms inventory was right.

The battle of Villers-Bretonneux on 24 April 1918 was no major German offensive but a local affair intended to improve the German positions by taking the small town of Villers-Bretonneux, the high-lying forests west of it, and the village of Cachy. This would provide good artillery observation of Amiens, the major rail hub between the French and British front sectors. The terrain had been assessed as favourable for A7V tanks (no wide trenches, and few shell holes). All three detachments (numbers 2 and 3 had become operational by the end of March) were deployed.

With one tank (543 '*Bulle*') of *Abteilung 2* out of order and staying behind at Marchienne-au-Pont, the home base of the A7V detachments near Monceau-sur-Sambre, and one (503 '*Faust*') of *Abteilung* 3 broken down after detraining, thirteen A7Vs participated in the attack. Their employment would be a nasty surprise for the British. (Since those British soldiers who had witnessed German tanks at St. Quentin were either dead or prisoners of war at the end of the day, the first German tank action had remained unseen by the Entente commanders.).

The vehicles were divided into three groups: Group I with three tanks (526, 527, and 560) from

A look into the command post of an A7V. The driver's seat – surrounded by levers – is at the right. Slight turns of the tank could be made with the steering wheel. For a full turn, on the spot, one track was put into reverse gear. While the driver had full control over the movements of the A7V, his field of vision forward was impeded by the vehicle itself, allowing observation of the ground in front of the tank only further away than nine metres. The commander's position is to the left. He had no duties other than to direct and co-ordinate his crew's activities and to observe the terrain. When travelling behind the front, the command turret's front, top and rear armour plates could be folded down for better ventilation. The front plate could be raised independently while the top and rear remained folded down. (Strasheim Collection)

Abteilung 1:

Group II with the four tanks (501, 505, 506, and 507) of *Abteilung 3* and two (541 and 562) from *Abteilung 1*:

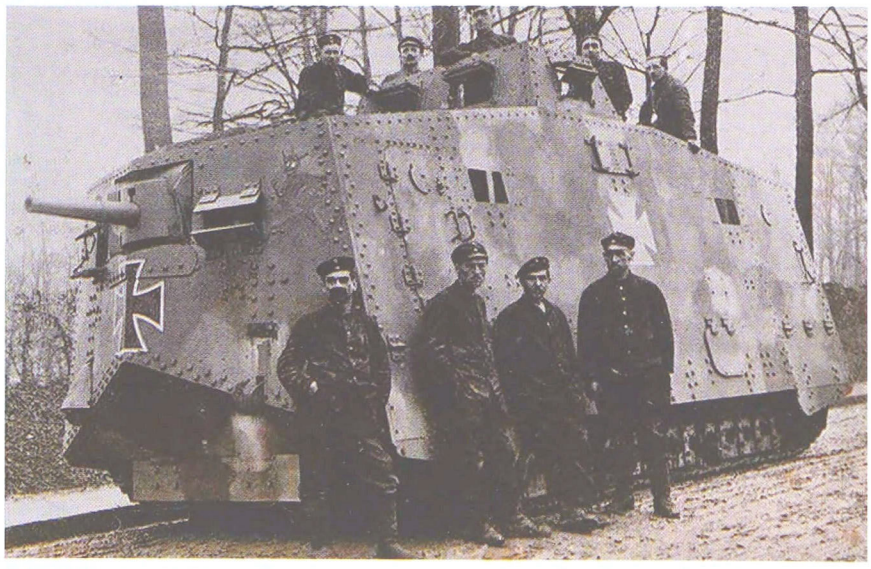
Group III with the four tanks (504, 525, 542, and 561) of *Abteilung 2*.

Group I had the most favourable terrain. Despite the morning fog which (as at St.Quentin) clogged the battlefield, Tank 526, the mount of *Oberleutnant* Skopnik, advanced at high speed, ploughing through the utterly surprised British defenders with continuous cannon fire and blazing machine guns. Reaching the outskirts of Villers-Bretonneux, the tank crew noticed that the German infantry had not been able to follow, so they turned their vehicle and drove back, shooting at any British that had survived their first run. After this 526 advanced together with the infantry, assisting them by subduing strong points that still held out.

An infantry battalion commander remembered: '*Suddenly I heard a strange engine noise behind me. Expecting that an English tank had broken through, I ordered some bundled charges to be prepared. Abruptly the fog lifted and I saw a tank with a big Iron Cross. The first German tank that we ever came across. I shouted: 'Hey there, Mr. Tank, get over here!' and the vehicle turned towards me. The small iron door opened and out jumped – a very tidy First Lieutenant, with dress-boots, spurs, creased trousers, and monocle. And us? Looking like swine in the mud! 'Is the battalion commander present?' – 'Right here!' – 'I'm at the Captain's disposal. What orders does the Captain have for me?' – 'Clear the English machine gun positions over there! How long will that take you?' – 'Twenty minutes. Where will I find the Captain afterwards?' – 'In the village at my command post.' Shake hands and off went the tank. Five minutes later we advanced into Villers-Bretonneux without any losses. After twenty minutes the First Lieutenant reported to my 'office'. 'Sir, announce capture of 160 Englishmen.' - 'Where are they right now?' – 'I've already sent them toward Germany.' – 'Very good, Lieutenant. Now I need your help to take an English artillery position beyond the village.' – 'I regret, Sir, but I'm running out of fuel and have to return to base.' We were thankful to 'Mr. Tank' anyway.*'

Tanks 527 '*Lotti*' (*Leutnant* Vietze) and 560 (*Leutnant* Ernst Volckheim) sped ahead and moved back in much the same fashion. After escorting the infantry into the village they were called back to subdue resistance at the brickyards, where the defenders still held out. Here they were joined again by 526. The tanks remained in the area until noon, busily reducing points of resistance that still held out, and advancing into the village – not least to collect some booty (toast, orange marmalade, real soap and other luxuries missing from the German '*Ersatz*' diet) before finally returning to their assembly area.

The terrain held more difficulties for Group II, and the British trenches were more elaborate in their area. This generally slowed the A7Vs down and the German infantry was able to follow suit, which also worked quite satisfactorily. Out of the fog the mighty tanks appeared and forced the defenders down, and before they could regain their balance the German infantry were upon them. Tank 541 broke resistance at a fortified farmyard by simply running through it knocking down walls. Tanks 505 '*Baden* I' and 507 '*Cyklop*', later joined by 541, advanced south of Villers-Bretonneux, helped repulse two British counter-attacks, and assisted the infantry in occupying their objective: the Bois d'Aquenne, the eastern part of the high-lying forests. Tank 506 '*Mephisto*', after a successful initial advance, got stuck in a large shell hole and was abandoned by its crew, which kept on fighting as an assault team.



Tank 506 'Mephisto' of Abt. 3 just before 24 April 1918. Note the emblem of a red devil running with a snatched rhomboid tank. It seems that during repairs at B.A.K.P. 20 (which became necessary after St. Quentin) the vehicle received tidy markings and a new coat of paint, most likely similar to that applied to the captured Mk IVs – green, red brown and clay yellow in irregular blotches. The camouflage colours were not considered permanent and weathered away rather fast, with clay yellow disappearing first. In this picture the front armour of the turret is up while the top and rear are still folded down. Being an early and not yet modified vehicle, 506 had no commander's hatch and no compass casing installed in the turret top plate, only a circular opening (for flags and flares) in the right forward corner. (Strasheim Collection)

Tank 501 '*Gretchen*', the only A7V still without a cannon, advanced south of the fortified farmyard but soon had engine trouble. The driver was wounded, and no reserve driver was carried. Only after Corporal Bönsch from '*Elfriede's*' crew got to the tank and succeeded in restarting the engines was '*Gretchen*' able to retire. Tank 562, carrying an experimental wireless set with drag antenna, experienced engine trouble as well (which impelled the commander, *Leutnant* Wolfgang Bartens, to form a temporary assault team) but finally joined 505, 507, and 541 near the Bois d'Aquenne.

Group III had a complicated task. To support the infantry into Cachy they had to circle north around two small forests and then south again to meet the infantry exiting the forests. While circling through the fog-clogged expanse Tank 542 '*Elfriede*' slipped into a sand pit and fell on her right side. She was abandoned by her crew, which now also formed an assault team. Two men, one the commander, *Leutnant* Stein, were killed in the process and Private Anders was missing, later turning up as a prisoner of war with the enemy.

Tank 561 '*Nixe*', while circling, supported the infantry of the northern neighbour division, but then – the fog lifting – the commander, *Leutnant* Wilhelm Biltz, was able to make out his objective, the spire of Cachy church, and changed direction towards that village.

Now unfolded the first tank-versus-tank engagement in history. While advancing and firing at British positions at the fringe of Cachy, 561 ran into three British Mk IV tanks that had been ordered forward to defend the line between Cachy and the Bois d'Aquenne. Two of these were female tanks, only one, No. 4066 commanded by 2nd Lt Mitchell, was a male. There are two accounts of this engagement. One by Mitchell, which is a rather lengthy affair, while Biltz' report is quite short and to the point, in fact it is his after-action report, which he supplemented by some additional information in 1938. He noted several enemy tanks, three of which were of the familiar type and rather close, with the foremost already firing at *Nixe*. Biltz immediately had the reverse gear thrown in and the vehicle turned towards the enemy, simultaneously ordering his gunners to open fire. After several rounds had been fired at the Mk IV nearest to 561, the enemy ceased shooting and moving. The gunners (and Biltz) took this for evidence that the vehicle had been put out of action and – with *Nixe* turning left again – now concentrated on the two females (commanded by 1st Lt Hawthorne and 2nd Lt Webber), which were about to escape west, hitting both of them and stopping one. Just at this moment, *Nixe's* armour was penetrated near the gun. One of the gunners was killed immediately while two more were fatally wounded. Fearing that the tank might blow up, the crew jumped out and took cover. When the tank did not burst into flames and the driver found the engines still running, they reboarded the vehicle and were able to coax it about 2 kilometres eastwards before the engines finally quit. Mitchell's central narrative basically matches this report. As there are no photographs known that show the damage to 561, we may assume that it was in fact Mitchell's gunner who scored that hit (and two further ones detonating close to *Nixe's* right flank sending splinters below the side armour, damaging some pipes in the soft underbelly and eventually leading to engine breakdown because of oil and coolant loss), although the front armour of the A7V was supposed to be proof against a calibre such as the six-pounder of a male Mk IV.

The two remaining A7Vs of Group III, 504 '*Schnuck*' and 525 '*Siegfried*', had successfully made rendezvous with the infantry but their support was not enough to help the 77. *Reserve Division* take Cachy. The 77th had only recently arrived from the Eastern Front, and had had only five days of induction training into Western Front conditions by *Jäger-Sturm-Bataillon* 3. Now they were utterly confused and irritated by the constant shelling and the tenacious resistance they met – and their left wing regiment still hung back, fighting in the forests.

When – shortly after Tank 561 had been hit by artillery (in the perception of 77. *Reserve Division*, who did not see the Mk IVs) – an infantry counter-attack out of Cachy and a foray by seven Whippets coincided, the "*weak forward elements*" of the 77th's right wing broke. Those in front surrendered to the enemy, those behind ran back for some 1,000 metres. British publications usually highlight the carnage that the Whippets allegedly caused by running over the hapless Germans, killing at least 400 of them. Looking at the German side – where an inquiry was held on the reasons why Cachy had not been taken – no indication of any such massacre can be found. However, the Whippets soon met resistance. The commander of Tank 525, *Leutnant* Friedrich Wilhelm Bitter, noticed the strange looking vehicles (he thought they might be French) and had his tank turn towards them and open fire. Simultaneously a battery of 77 mm field cannons of the right neighbour division went into firing position and blasted away at the Whippets, as did several minethrowers[1] from both divisions, while the small arms of the 77. *Reserve Division* remained ineffective because they had no steel core bullets. One minethrower took on Mitchell's 4066, which had now been identified as attacker number eight, and split the left track, after which Mitchell's crew abandoned the vehicle. In short order, four Whippets were hit and put out of action while the remaining three retired hastily. But the smoke columns from two burning Whippets were no incentive for the exhausted and bewildered 77. *Reserve Division*. They started to dig in. Cachy would remain in British hands.

The A7V attack had been an overall success, and *Hauptmann* Rohr's assessment had been confirmed in battle. But a night-time counter-attack with two pincers, one out of the Somme valley, the other out of Cachy, retook most of the ground and thus overshadowed the tank action. (Ironically, the whole affair thus resembles Cambrai re-enacted in miniature with roles reversed.) The blame clearly went to 77. *Reserve Division*, which had failed to secure Cachy thus exposing the German centre to a serious flank threat.

On 25 April three A7Vs remained on the battlefield: 542 lying on its side but completely intact behind the Entente front line (to be salvaged in May and tested subsequently); 561 blown up by a German demolition squad during the night; and 506 intact in a crater behind the German front line but soon heavily damaged by a shell hit (the only A7V to survive, salvaged by the Australians in July 1918, transported to

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[1] These were developed by the engineer branch with the aim of delivering heavy charges (up to 50 kg of explosives) in fortress combat. Because of the lack of proper artillery ammunition, they were also used in the initial phase of trench warfare. That made them quite popular and led to an expansion of the arm. Unlike mortars (such as the British Stokes) their rate of fire was very slow, and unlike howitzers they lacked range. Their advantage was that the bombs could easily be manufactured by companies that did not have the expensive and sophisticated equipment necessary for artillery shells. As they were technically complicated, had a slow rate of fire and were cumbersome to transport, they were finally replaced by mortars (on the model of the Stokes). Yet ordinary mortars are in no way equivalent to mine throwers as they lack the 'punch'. Those used by troops around Cachy were all of the light type, which had the highest rate of fire and the least punch. These weapons were used for anti-tank purposes on a flat trajectory mount and proved quite successful as 'tank killers'.

Abt. 11's Tank No. 3 'Käthe'. The German attack on 27 May 1918 did not see much tank combat action. However Käthe managed to follow and support the infantry and eventually even fired some cannon shots at the enemy retreating beyond the Aisne river. The tank commander, Lt Alfred Geyer, stands second from left. In Abt. 11's numbering system the male tanks carried the numbers 1 and 3, the females 2, 4 and 5. Abt. 11 is also unique in giving a girl's name to a male Mk.IV. Abt. 11 used white circles for identification. (Strasheim Collection)

Tank 560 followed by 527 and (most likely) 526 on the approach march. This picture was presumably taker on 31 May or 1 June 1918. As always, as many crew members as possible try to escape the interior heat, noise and fumes The Skulls and Crossbones are a distinctive mark of Abt.1. Only in October 1918 – after having been annexed to Abt.1 – did Abt. 2 vehicles start to display them too. The extensive use of camouflage nets as seen in this picture is also a distinctive trait of Abt. 1. (Mario Doherr Collection)

Australia and still on exhibition in Brisbane, Australia today). Statistically, about 13 per cent (two vehicles) of the tanks broke down before the attack and 20 per cent (three vehicles) were lost due to the non-existent salvage capability.

The next tank action went to the captured detachments. *Beute-Abteilungen 11, 12, 13*, and *14* participated in the offensive at the Chemin des Dames on 27 May 1918. While the German infantry stormed ahead the Mk IVs slowly crept along, always behind the action and hardly spending ammunition. Only in *Abteilung 12's* sector did strong resistance temporarily check the attackers. The tanks (only three had negotiated the enemy's first trench line) arrived and two of them were almost instantly knocked out by French 75 mm field cannons.

The next attacks near Reims saw the A7Vs at their worst, confronted with terrain they could not negotiate and French 75s to take advantage of their immobility. One (Tank 529, Biltz' '*Nixe* II') was lost in a badly co-ordinated action on 31 May, another (527) in a badly reconnoitred diversionary skirmish on 1 June.

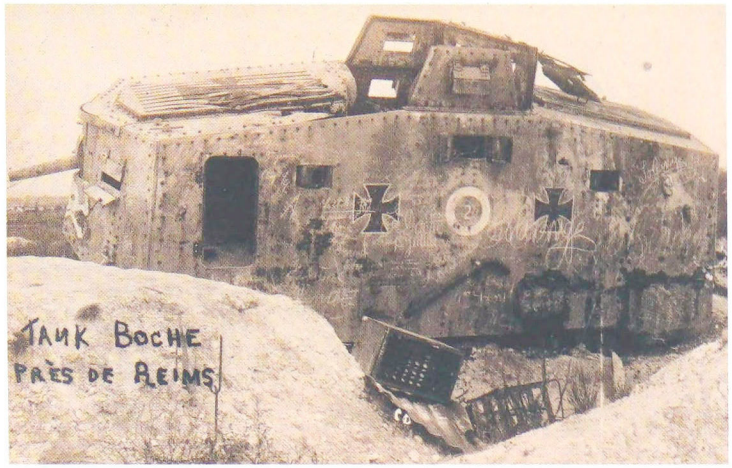
On 1 June, in an attempt to take the Fort de la Pompelle east of Reims, *Beute-Abteilungen 13* and *14* went into action too. *Abteilung* 13 lost all three serviceable tanks, plus one each from *11* and *12* reinforcing them. *Abteilung 14* lost three of its four operative tanks. The infantry grumbled: '*The tank attack failed completely. But at least they did attract the enemy shells away from us.*' In reality only the *Abteilung 13* tanks had accomplished nothing at all, those from *11, 12*, and *14* had done what they were supposed to. The infantry was effectively supported into the fort, but proved too weak to hold it and by noon were back in their old trenches, leaving behind eight Mk IVs lost (of which only a single one was salvaged later on).

Now the pattern was set. The A7Vs would either fail because the terrain was unsuitable for their use, or achieve good results on favourable ground. The captured Mk IVs would either miss the action because they were too slow to keep pace with the infantry, or (irrelevant whether in success or failure) swiftly be knocked out if they joined combat.

Tank 507 'Prinz Eitel Friedrich' of Abt. 3 seen near Tilleloy on 8 June 1918. Despite the ban on using royal cognomina already issued on 25 May, Abt. 3 displayed the Hohenzollern family names for identification purposes during the tank attack on 9 June. 543 became 'Prinz Adalbert' (later changed to 'Adalbert'). A regimental history mentions an A7V 'König Wilhelm'. On 505 a faint 'Wilhelm' can still be traced in early September, and 503 has a 'K..' still. Abt. 3 relied on frequently changing names for identification and is not known to have adopted the 1 to 5 number scheme at all. Also, their tanks still displayed a single Iron Cross each side as late as October 1918. (Strasheim Collection)

The engagements to follow were:

- 9 June, at the river Matz: *Abteilungen 1* and *3*, no tank losses. *Abt.3* (Tanks 503, 505, 507, 543, and 564) supporting the infantry with overall success against an enemy ready to fall back. *Abt.1* bringing only two tanks (541 and 562) to bear, of which one (562) became stuck in a French battalion command post, after which the tank attack stalls.
- 15 July, at the Forêt de la Montagne west of Reims: *Abteilungen* 1 (Tanks 501, 540, 541, 560) and *2* (Tanks 504, 525, 563), accompanying a successful advance against a delaying screen of Italian troops, no tanks lost. The skilful use that the Italians made of well-positioned small machine gun parties was effectively thwarted where the tanks advanced.
- 15 July, in Champagne south of Somme-Py and east of Reims: *Beute-Abteilungen 11, 12, 13*, and *14* also in support of the final German offensive. No success, but heavy losses against stubborn resistance. From a total of 20 available

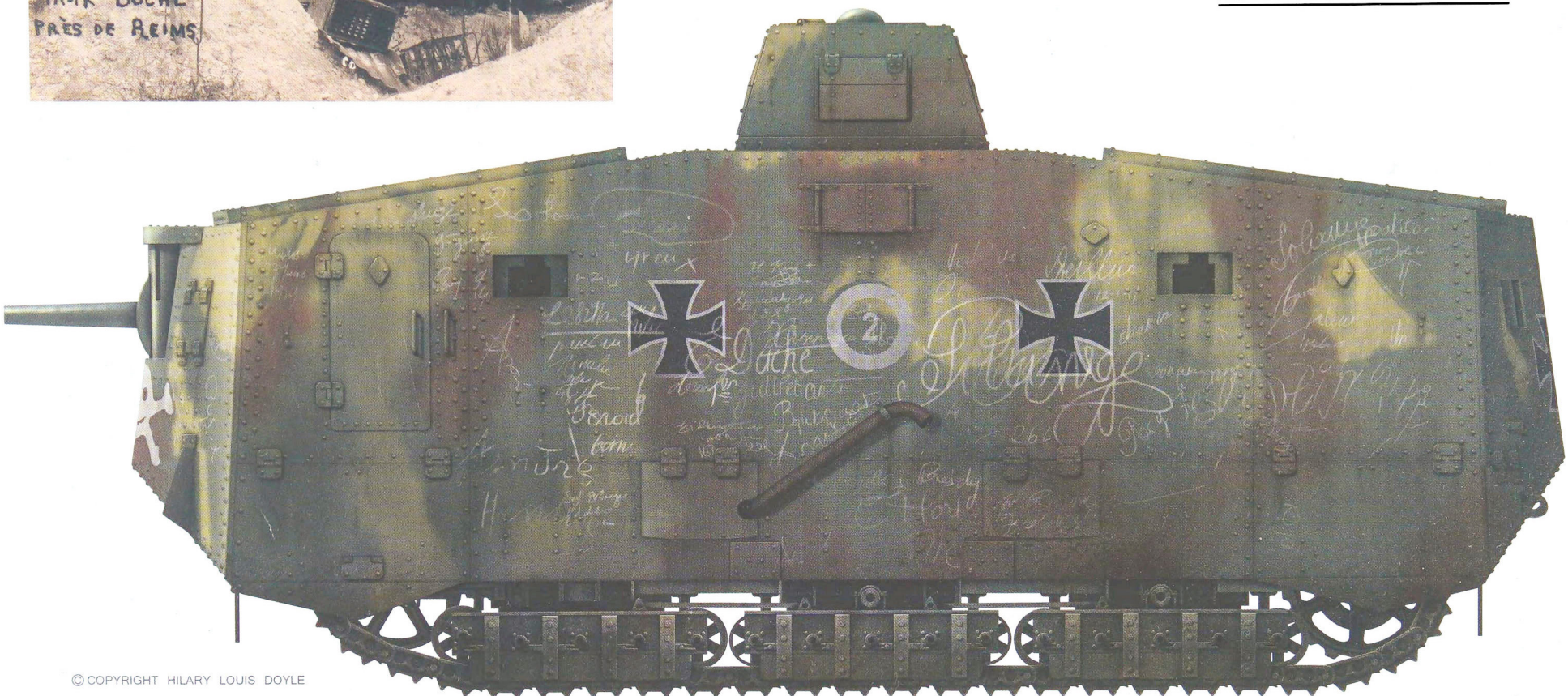


Tank 527 of the Villers-Bretonneux Abt. 1 (an A7V type) lies abandoned east of Reims after having been hit by a French 75 mm cannon on 1 June 1918.

Although the front armour may have been proof against such hits, neither the roof nor the turret were. Note the Iron Crosses for aerial identification on the front and rear louvres. Note also that the louvres are of the second type with nine longitudinal slits instead of 45 small slots. These second type louvres were installed on Tanks 525, 526, 527, 528, 529, 560, 561, 562, 563 and 564. The ammunition box for the cannon lies besides the tank as does one machine gunner's seat. After Villers-Bretonneux Abt. 1 adopted the number-in-ring system also in use with the captured detachments.
The ring colour is white. (Strasheim Collection)

A7V Specification

Weight: 30 tonnes
Crew: 18
Engines: 2 x Daimler 100 HP
Speed: 9 km/h
Armament: 57mm Maxim-Nordenfeldt and 6 x 7.92mm Model 1908 Maxim machine guns
Length: 7.34 m (24ft 1 in)
Width: 3.1 m (10 ft)
Height: 3.3 m (10ft 10 in)
Armour: 7.5 mm to 30 mm



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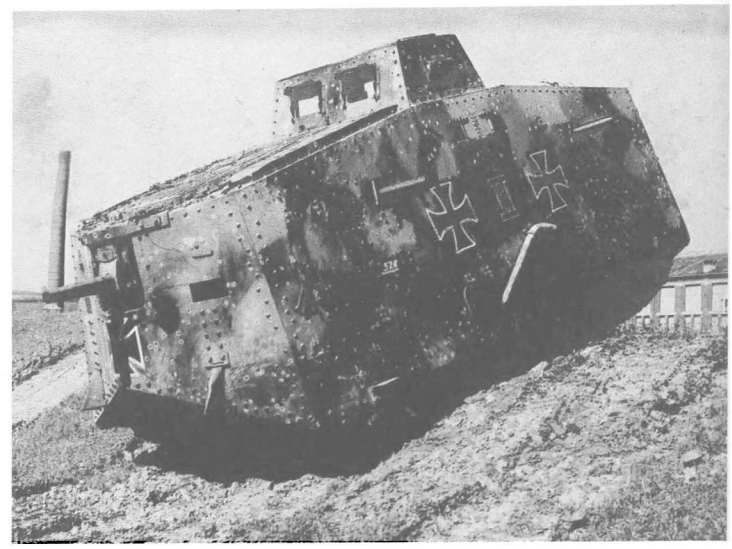
562 stuck in a French command post after 9 June. Again, a guard has been detailed to prevent equipment being 'found'. The picture clearly shows the limitations of the A7V – its 'low nose', aggravated by the 3 cm front armour and the cannon, trapped it definitely in a situation that never would have stopped a British rhomboid. Note the commander's hatch (at rear) and compass casing (in centre) of the turret top plate. 562 was later salvaged and – after repair – given to Abt. 2 where it received the name 'Herkules'. (Strasheim Collection, courtesy of Didier Guènaff)



Tank 525 'Siegfried' of Abt. 2 seen at Marchienne-au-Pont, most probably after the combat on 15 July 1918. The number '520' chalked beside the front door is not the tank number but the number of bullet impacts counted and marked with white circles. Strangely, 525 does not show the extra turret armour peculiar to Abt. 2, and did not have it fitted in action either as indicated by the hit marks on the turret, although 529 'Nixe II', lost on 31 May, already displayed that feature. There is camouflage paint applied to the vehicle, presumably again green, red brown and clay yellow in irregular patches. False apertures have been painted on the male bow. Abt. 2 used Roman numerals (initially in solid white, after Villers-Bretonneux in red with white outline) instead of the number-in-ring system. (Strasheim Collection)

vehicles, 13 entered combat of which 11 were lost of which four struck landmines and four more were hit by artillery.

● 31 August, at Frèmicourt: *Abteilungen 1* and *2* employed. The former did not arrive in time because all tanks broke down during the 20 km approach march, causing 30 friendly casualties when a house in Beugny collapsed due to engine vibrations. The latter conducted an uncoordinated and eventually unsuccessful counter-attack. Tanks 504 '*Schnuck*' and 528 '*Hagen*' were lost. Additionally, Tank 562 '*Herkules*' had already been hit by an aerial bomb in the assembly area.

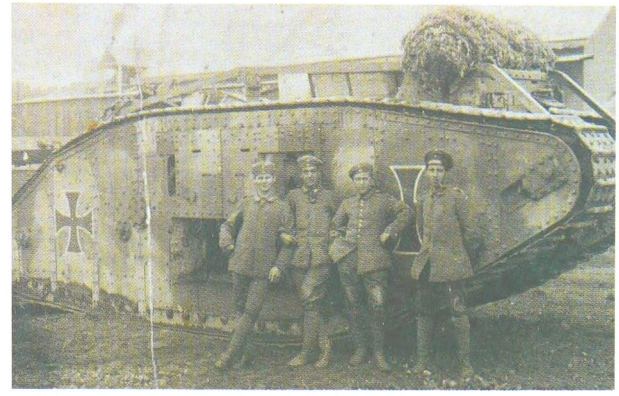
● 7 October, at the River Arne near St.Etienne: *Abteilung 3* with four serviceable tanks providing close artillery support to another uncoordinated yet successful counter-attack, and regained possession of the town for some hours. No tank lost.

● 8 October, east of Cambrai: *Beute-Abteilungen 11*, *15* and *16* in combat with tanks of British L Battalion (12th Bn), involving Mk IV versus Mk IV, with each side losing four vehicles in the mêlée. It was temporarily a successful German counter-attack. This is the only known occasion where German tanks used 13 mm anti-tank rifles against their opponents: 10 shots were fired on two British Mk IVs, both vehicles belonging

22. "Le Front de Champagne" — EPINE de VEDEGRANGE, tank Anglais utilisé par les Allemands
détruit sur une mine Française en 1918

This Mk.IV male was probably photographed in 1919 or 1920. The German camouflage paint has weathered away and only the Iron Crosses and a very faint identification circle remain above the former British tint (which was the chocolate brown). The semblance of an identification circle indicate that this was a vehicle of Abt. 14, who used light blue as a circle colour. This supposition is verified by the place name 'Epine de Vedegrange', which clearly lay in Abt. 14's sector of attack on 15 July 1918. The vehicle ran over a landmine that broke the right-hand track, after which the crew abandoned it without blowing it up. Note the faint 09 below the Iron Cross. This indicates that the front male tank seen in the bottom photograph on page 4 met its fate here for a second time. (Strasheim Collection)

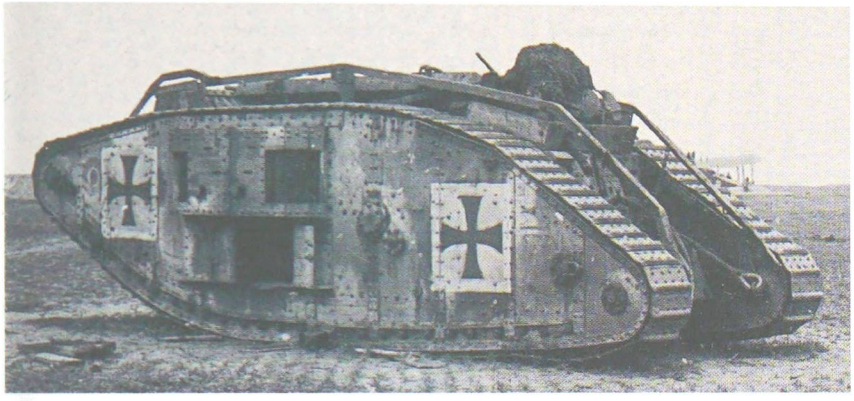
to the four that L Battalion lost. But, all told, the losses were higher. Three disabled tanks of *Abt.11* had already been abandoned prior to the encounter because salvage proved impossible in the continuous shelling. A fourth had also been hit but was extricated although remaining unfit for combat. One tank of Abt. 15 had been knocked out too but was able to retire to the railhead under its own power. And on 9 October, two more tanks were blown up because they could not be moved to the railhead.



Tank 120 of Abt. 14 seen at Roux. It subsequently received the name 'Liesel'. This is not the 'Liesel' lost at the Fort de la Pompelle on 1 June 1918, but the second or even third Liesel. Abt. 14 frequently used the same name again when commissioning a replacement tank for a vehicle lost. The number 120 can be read on the inside of the escape hatch. Three of the soldiers wear leather patched trousers. The tank does not yet display the light blue identification circle on the horn but a name on its rear side armour, which indicates that it has just been issued to Abt. 14. (Strasheim Collection)

● 11 October, at Iwuy: *Abteilung 1* – also in charge of *Abt. 2's* remaining vehicles – (Tanks 501, 525, 541, 560, and 563) supported a successful counter-attack, with one loss (560) – and Bavarian *Beute-Abteilung 13*, losing three tanks (118, 137, 142) without entering combat. Again, overall losses were higher. Abt. 1 had already left behind (and cannibalised) Tank 540 on 3 October. *Abt. 13* abandoned and destroyed Tank 127 on 9 October and 213 on 12 October.

● 1 November, near Valenciennes: *Abteilung 12* spearheaded a successful counter-attack (with three of their five tanks became unserviceable). *Abt.13* brings only one tank (coming under *Abt.12's* command) forward and lost it due to a direct artillery hit. *Abt.14* initially remained in reserve and finally moves up to cover the left flank. *Abt.14* had four serviceable tanks plus one in need of repair at the end of the day and remained with *17. Armee*, while *12.* and *13.* are withdrawn. This was the final German tank action to take place in World War 1.



Tank 118 of Bavarian Abt. 13 stands forlorn near Chateau Avesnes-le-Sec after 11 October 1918. As Abt. 13 had been out for demonstrations and exercises since mid-August, the change to Buntfarben camouflage and Latin Crosses ('Balkenkreuze') had not yet been implemented. White squares emphasise the Iron Crosses and – if orders have been followed – a diagonal white band on the roof is added for aerial recognition.118 was the No. 3 tank of Abt. 13 and commanded by Lt Joseph Korb. Abt. 13 used yellow circles for unit identification. According to Abt. 13's combat report the vehicle was set on fire when it was abandoned by the crew. Note the rail arrangement above the command cupola, a peculiarity of Abt. 13 tanks in the period from the end of July to early October 1918. (Strasheim Collection)

In all cases there were too few German tanks to make a lasting impression. Even successful counter-pushes such as those on 8 and 11 October and 1 November only restored the situation for some hours before the enemy advance continued.

Starting in mid-August 1918, after the successful Franco-British tank attack east of Amiens, each army group on the Western Front received one tank detachment for familiarisation training

Three captured Mk.IVs – two male, one female – clad in Buntfarben ('coloured tint', a camouflage pattern officially introduced in July 1918) are seen here after recapture. Le Quesnoy was taken by the New Zealand Division on 4 November 1918. No names or numbers are visible, although the right hand tank may carry an identification circle. The tanks could be relics of the actions on 8 October, in which case they would be Abt. 16's vehicles, or on 1 November, in which case they would have belonged to Abt. 14 (the only detachment that was not withdrawn), although it is difficult to see how and why the detachment should have moved south-eastwards to Le Quesnoy. (Strasheim Collection)

The Whippet tank with Abt. 13 suffered damage on 8 September while negotiating a crater at the Lieu St.Amand training area. In this picture the vehicle has been winched up and rests on a pile of lumber. The crew watch the ongoing exercise, as do the officers to the left. In the background a male Mk.IV of Abt. 13 can be seen. Note the Iron Cross on the Whippet's bonnet. This is the only Whippet known to have carried German camouflage (again green, red brown and clay yellow) and markings. It was later briefly seen with Tankabteilung Körting in January 1919. (Strasheim Collection)

with tanks. These training courses lasted until the end of September. Only *Abteilungen 1* and *2* remained at Marchienne-au-Pont (except for their unsuccessful sortie to Frèmicourt), while at Roux (also neighbouring Monceau-sur-Sambre), the home base of the captured detachments, *Beute-Abteilungen 15* and *16* gradually became operational.

At the end of September OHL ordered a concentration for one big counter-push with all nine detachments, a force of about 45 tanks (including some spare Mk IVs). But this plan was abandoned again before the detachments could even be put on trains.

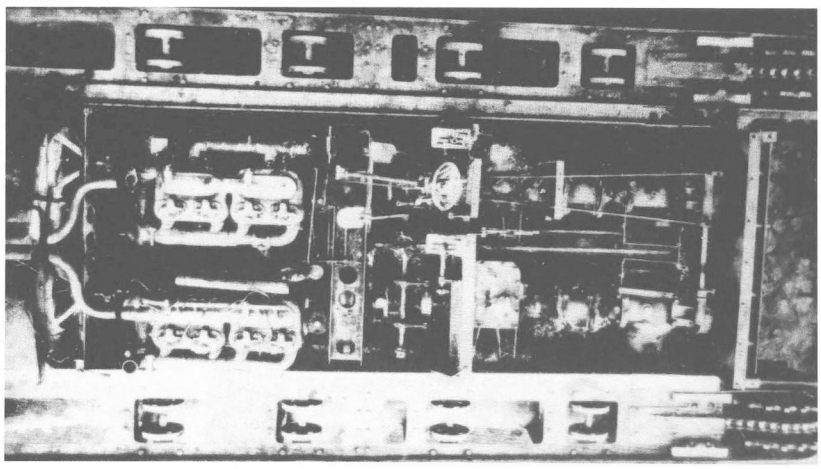
As the German *17.* and *3. Armee* were now the targets of powerful enemy attacks, both were given tank detachments on various occasions. Yet only *17. Armee* managed to use the tanks successfully in several instances, while only one of the planned missions in *3. Armee's* sector was effectively executed but utterly unsuccessful because the A7Vs of *Abteilung 3* could not negotiate the Arne brook at St. Etienne – the existing bridge had been blown up by friendly forces just prior to the counter-attack that *Abteilung 3* were to support.

17. *Armee* however, constantly appealed for tanks and used them – not because the individual tank actions were such glorious successes, but because of the moral support that the presence of friendly tanks gave the infantry. Even the fiasco at Frèmicourt, where co-ordination between tanks and infantry had not happened at all and one tank (504) was hit by friendly fire (the 77 mm rounds did not penetrate the front armour, but the impacts convinced the crew to abandon the vehicle), never discouraged 17. *Armee*.

After the enormous force that the counter-attack at Iwuy had displayed, the infantry even asked specifically for A7Vs – in clear appreciation of what a powerful machine the fast and well-armed A7V was if employed for high-speed counter-strikes on favourable terrain. (OHL, in contrast, always warned when deploying A7V detachments: '*Transferred tanks are of the obsolete German type. Caution! Not to be used in heavily shelled terrain.*')

In terms of developing the German tank arm, the first steps occurred in late summer and early autumn. A tank training area was set up close to Monceau-sur-Sambre, a tank commanders' training course was launched (but never completed), and at home a tank-replacement detachment was about to be established at Zehrensdorf on the Zossen manoeuvre ground. New formations were also envisaged: the personnel of a Saxon and a Württemberg captured tank detachment were just gathering, and the Bavarians were planning to enhance their contribution. The German collapse of late October and early November 1918 stopped further progress.

Another fast vehicle (with a top speed equalling that of the A7V) fell into German hands in summer 1918: the British Medium A, called 'Whippet', a number of which had been captured during the German advance in late March. After intensive testing the verdict was that the Whippet was a good vehicle that might well be worth copying – if the LK. II with superior characteristics was not already under construction.

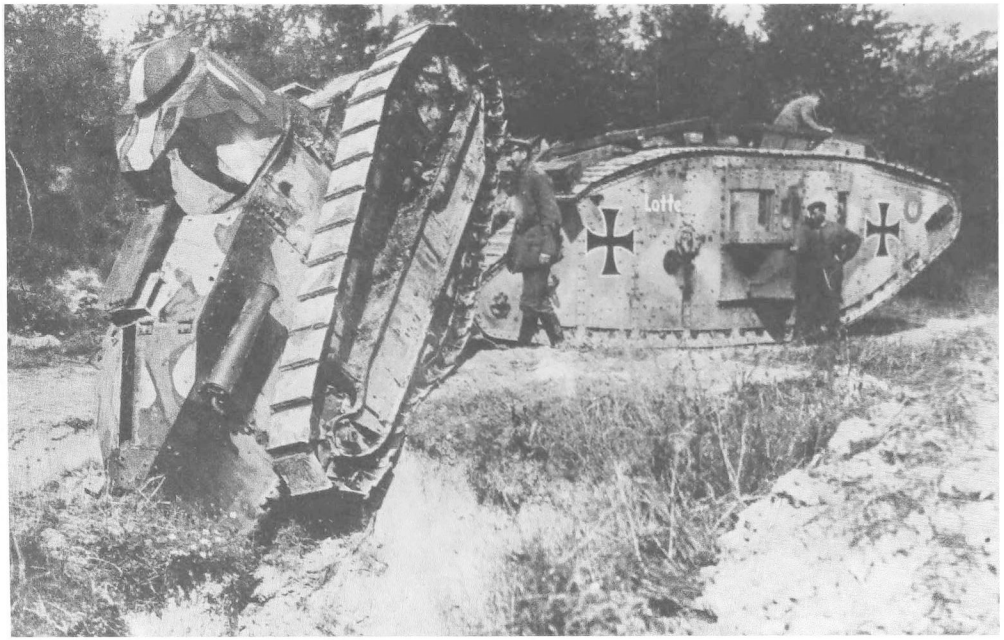


The first Whippet restored by B.A.K.P. 20 was immediately sent to Berlin in spring 1918. It is seen here with the armoured body removed for study purposes. With each track driven by one Taylor engine, the mechanical arrangement of the Whippet was as complicated as that of the A7V. The LK tanks used one engine to drive both tracks and consequently needed only one gearbox. (Strasheim Collection)

An early LK prototype arrived for field tests and comparison at *Abteilung* 3's training and demonstration area near Saarburg on 30 August 1918. Only two of the Whippets captured were restored to running condition. One was immediately sent to Berlin, where the German engineers disassembled it for comparison with ongoing LK construction.

The second runner was temporarily given to *Abteilung 13*, which undertook the tank familiarisation exercises for Army Group Crown Prince Rupprecht, but in mid-October it was called to Berlin. (This vehicle, the only one to carry German camouflage and markings, was later seen in *Freikorps* use in January 1919.) The often repeated rumour that the Germans fielded a whole detachment of Whippets holds no substance.

Several non-running tanks were also used in familiarisation and anti-tank

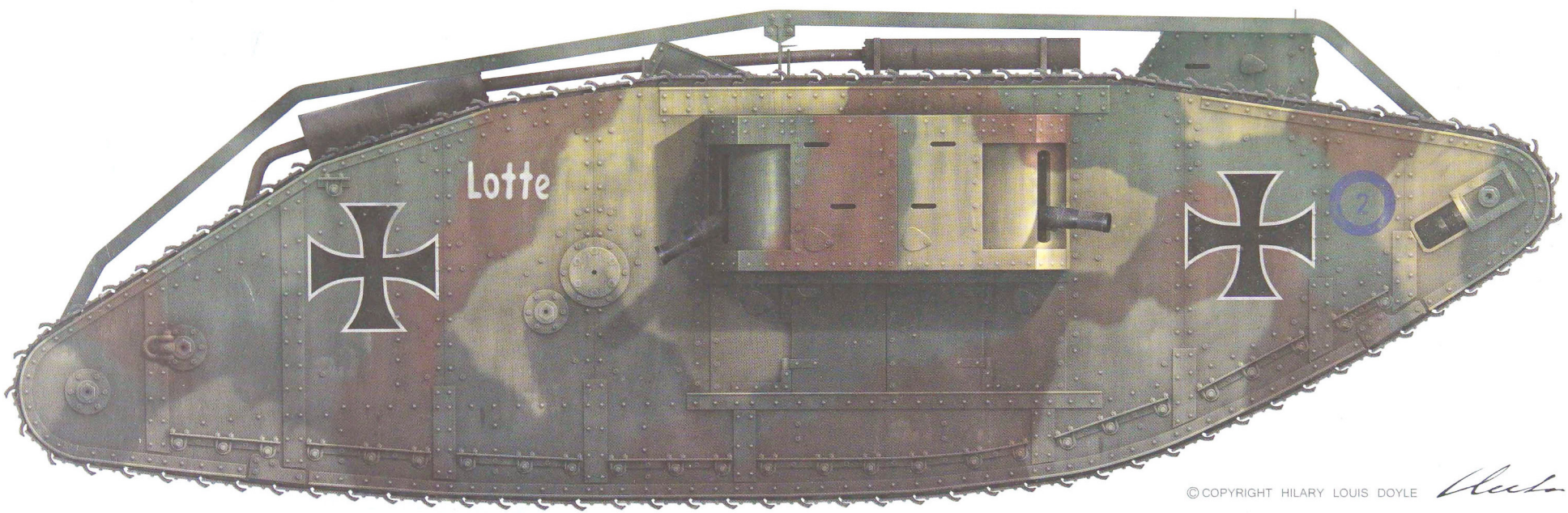


A captured British Mk.IV, known as 'Lotte' photographed with a captured Renault FT17 Runner of Abt. 14 at a staff training ground near Sedan in September 1918

While Abt. 13 had the Whippet, Abt. 14 received a Renault FT17 runner for exercises and demonstrations with Army Group German Crown Prince. After capture, this Renault somehow lost its machine gun-armed turret (on which the tank's name 'Hargneuse' – Biting One – was written) and received a wooden turret mock up. The Mk.IV is 'Lotte', however not the one lost at Fort de la Pompelle on 1 June 1918, (which was No. 3) but a later successor (No. 2 tank of the detachment). The photograph was taken in September 1918, most probably on the former training ground of the leaders and general staff training course near Sedan. (Strasheim Collection)

Captured British Mk IV (Female)

Weight: 27 tonnes
Crew: 8 -12
Engines: Foster-Daimler 105 HP
Speed: 5 km/h
Armament: 2 x 6pdr 5 x MG
Length: 8 m (26.4ft)
Width: 3.2 m (10.5ft)
Height: 2.4 m (8.17ft)
Armour: 6 to 12mm



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training (plus a huge variety of dummy tanks made from lumber and canvas).

After 27 May 1918, a number of Renault FT17s were captured as well. A running one (with a wooden turret mock-up) appeared with *Abteilung 14*, which undertook the tank familiarisation exercises for Army Group German Crown Prince.

Another runner was sent to Berlin and subjected to anti-tank tests at Marienfelde in late September 1918. The Germans dismissed the FT17 as too slow and having insufficient trench crossing capacity.

The end of the war caught the German tank force in the process of relocation. B.A.K.P. 20 was destined for the MAN factory at Gustavsburg near Mainz, but never arrived as a coherent formation. The tank detachments were transported to Erbenheim near Wiesbaden, where the tanks were parked on the terrain of the horse race course while the soldiers elected their soldiers' council, received their final pay and started for home because the war was finally over.

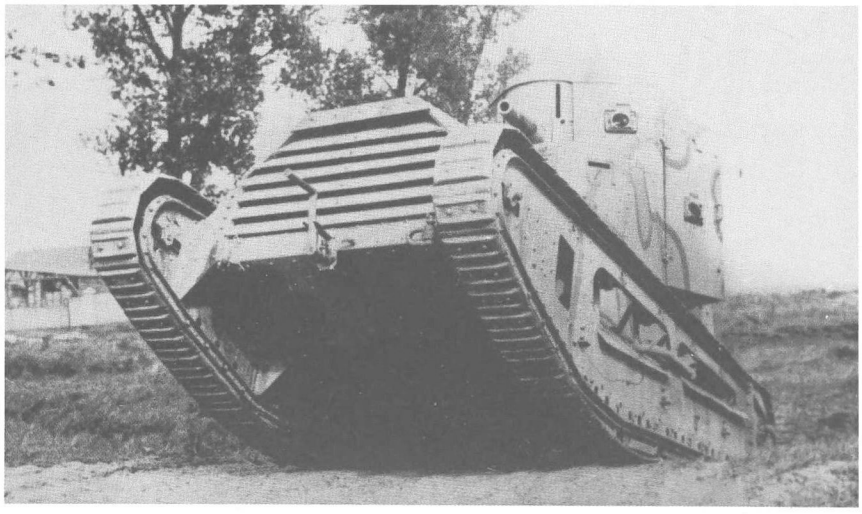
Another captured Renault runner was No. 66260 'Manoeuvre', seen here with soldiers of the Württemberg mountain battalion. This tank was later sent to Berlin where – together with Mk.IV F.41 and the first Whippet – it featured in an anti-tank primer illustrating the weak spots of Entente tanks. It was most probably also the Renault subjected to anti-tank tests at Berlin-Marienfelde in September 1918. One advantage of the FT17 was that it could easily be transported on trucks or trailers, thus overcoming the dependence on railway lines which severely restricted the deployment options of the heavier designs. (Strasheim Collection)

On 27 October *Abteilung 2* was formally handed over to *Hauptmann* Hans Thofern, Commanding Officer of *Abteilung 1*, who had already taken over *Abteilung 3* on 23 October. Now only one A7V detachment remained, with a total of ten tanks of which eight were available and perhaps four operational. On 3 November *Abteilung 1* was put on trains at Marchienne-au-Pont and travelled toward Erbenheim.

In all, the small German tank force had lost about 80 dead, 220 wounded, and some three or four soldiers taken prisoner of war by the enemy. From a TOE strength of almost 1,400 soldiers of all ranks, this amounts to losses of roughly 22 per cent.

The German plan for 1919 shows that the lesson had finally been understood. This plan was first formulated in June 1918, far in advance of the big Entente tank attacks at Soissons and Amiens, and even before the final German offensive failed on 15 July. It is therefore a remarkable piece of evidence: the early decision to mass-produce tanks was a reflection of realising that Germany was no longer able to achieve victory in 1918 – even while preparations for the Champagne offensive and the '*Hagen*' assault against the British front line were still taking place. It is also clear that once the paramount importance of tanks had been understood the problem of resource allocation was no longer held relevant.

The tank force would consist of light LK and heavy Oberschlesien tanks. For the interim period the A7Vs and the Mk IVs would be used as heavies until the Oberschlesiens became ready. The plan called for 150 heavy (Mk IVs, of which 170 were reported to be still available, and the remaining A7Vs, which were expected to expire soon) and 400 light tanks in April 1919 (the programmed number of LKs – not yet contested by reality – quickly inflating to 800 and 1,000). The total numbers of tanks envisaged for end-1919 were 4,000 LKs and 400 Oberschlesiens.



An LK.II clad in Buntfarben on test. This one carries the 5.7 cm cannon also used in the A7Vs and the captured male Mk.IVs. The gun was found to be too heavy and its recoil too powerful for the LK. The solution envisaged was the 3.7 cm cannon under development by Krupp. However that weapon was not yet ready by the time of the German collapse. LK production therefore concentrated on machine gun armed tanks only. LK development was a continuous process in which the LK.I was improved into the LK.II machine gun version, while the LK.II gun tank provided the second line of development. The – blueprint only – LK.III finally arrived at the 'modern' layout of the FT17. (Strasheim Collection)

The heavy tanks would operate in detachments of 15 vehicles divided into three companies with five tanks each. The light tanks would come in detachments of 100 vehicles divided into three companies. A company would have 31 tanks and consist of three platoons of 10 light tanks each. One third of the LKs would be gun armed, two thirds would carry machine guns.

However, Germany's collapse and the subsequent terms of the Versailles Treaty put an end to these schemes. What is known about actual LK production leaves serious doubts as to whether even 400 machines could have been ready in April 1919.

A proper tactical doctrine for tank warfare still had to be developed.

While the record of the German tank detachments in 1918

Two A7V (Überlandwagen) chassis had been provided to the signals branch which proposed to develop a special communication tank. These vehicles were not intended for use with the tank detachments but were to serve as communication centres for all troops, especially in attack. Only the front right and rear left barbettes had been constructed as machine gun mounts; those at the front left and rear right were designed to carry signalling lamps. Apparently Oblt. Hans von Skopnik (believed to be the second man from right) seized the two uncompleted vehicles in November 1918 and organised their completion as riot control tanks at Steffens & Noelle's. (Note the fourth and sixth man from right, also visible together with Joseph Vollmer in the picture on page 3). One vehicle showed up with Kokampf in January and May 1919, carrying the number 54 and later the name 'Hedi'. The fate of the second one is not known. (Mario Doherr Collection)

can be traced with sufficient detail, only fragments of the story of the armoured *Freikorps* units are known. The written sources are few and disconnected, and the known photographs allow only glimpses.

During November and December 1918, the German armies in the west conducted a well organised retreat and – once arrived on German soil – melted away like ice in the sun. In parallel, new voluntary formations emerged. These were called '*Freikorps*', taking up a tradition from Prussia's fight against Napoleon in 1812/13. The *Freikorps* had two important tasks: protection of the eastern borders ('*Grenzschutz Ost*') and safeguarding the internal order and cohesion of the Reich.

The German more-or-less government-controlled forces peaked with some 600,000 men in spring 1919, but downsizing had already started in June/July of that year. The last *Freikorps* were disbanded in early summer 1920, and by 1 January 1921, the size of 4,000 Officers and 96,000 NCOs and men prescribed in the Versailles Treaty had been achieved (plus 15,000 sailors in the minute navy).

One of the better known armoured *Freikorps* formations was '*Tankabteilung Körting*', also known as '*Kokampf*' (*Kommando der Kampfwagen-Abteilungen* – combat vehicle detachment command) or '*Kampfwagen-Abteilung Lüttwitz*'. The nucleus of this unit seems to have been formed by *Oberleutnant* von Skopnik (not to be confused with *Oblt.* Skopnik of A7V-*Abteilung 1* who was killed in the summer of 1918), who seized the two prototype A7V '*Nachrichtenwagen*' (communication tanks) and arranged their completion, allegedly for '*Grenzschutz Ost*', which provided a good justification to persuade factory workers otherwise generally unwilling to assemble weapons that might be used against themselves or their colleagues.

On 7 January 1919 *Hauptmann* Georg Körting, former deputy commander of the assault tank detachments, took command of the unit. Within the next few weeks, *Kokampf* was created and largely expanded.

Several other tanks were added to the inventory. Those known are:

'*Imperator*', an A7V tank (most probably 507, sent to Daimler for repair in October 1918)

'*Hanni*', an ex-*Abteilung 12* Mk IV female, Tank No. 4 of that detachment

Another ex-*Abteilung 12* Mk IV female, Tank No.3

(*Abteilung 12* had received a complement of new tanks on 23 October. Some of the old, worn out machines were apparently dispatched to Berlin for overhaul. Because of ongoing relocation, B.A.K.P.20 no longer accepted repair jobs from mid-October.)

At least two more Mk IV females of unknown origin (probably earmarked for the tank training detachment at Zehrensdorf) and one Whippet (the one that had been with *Abteilung 13*).

There may have been other tanks, but photographs – so far – only show the vehicles mentioned above.

Ninety light tanks, 38 Krupp-Daimler D.Z.V.R., 20 additional Ehrhardt, and 30 makeshift lorry-based armoured cars were ordered for '*Grenzschutz Ost*' in a largely scaled down version of Plan 1919. How many of these really saw completion – and at what date – remains open.

Hungary had possessed 14 LK.IIs, *'acquired very inexpensively from demobilised materials of the German Army'* since 1920. In 1921 Sweden bought at least 10 LK.IIs from Germany. While the Hungarian LKs were kept secret and hidden in railway wagons for some time, the Swedish machines were presented to the public as indigenous *Stridsvagn M21,* allegedly assembled and completed in Sweden from parts bought in Germany and with Swedish armour plating.

The organisational set-up of *Kokampf* (for '*Grenzschutz Ost*') originally foresaw three detachments, each with one heavy (tank) and two light (armoured car and motorised Flak) platoons, plus a central workshop.

'Hanni', followed by Kokampf's Ehrhardt armoured car, approaches the Alexanderplatz in central Berlin in early March 1919. This Mk.IV remained in support of the drive against Spartacist strongholds in eastern Berlin for several days. Note the special 'street fighting' version of the German steel helmet worn by most soldiers in the foreground. As the visor would hinder looking up to detect snipers on roofs and in windows, it was removed by this particular unit. Note also that civilian pedestrian traffic flows unimpeded in the background. Being an ex-Abt. 12 vehicle, Hanni carried a red identification circle with the number 4 inserted, plus the Kokampf plaque ('Kokampf – 153 – Abt.') and skull and crossbones. (Strasheim Collection)

A motley array of Kokampf vehicles at the Marstall (royal stables) in Berlin in the spring of 1919. The armoured cars are from left to right:
- Russian Fiat/15 'Strolch'
- Russian 60 HP Hotchkiss 'Lotta' (often misidentified as a Russo-Balt)
- Makeshift armoured truck 'Mausi' (note 2 cm Becker gun in turret)
- Makeshift armoured truck 'Schnucki' with same armament
- Russian Packard L-01015 (also with 2 cm Becker gun in revolving turret)
- Russian Packard L-0?
- Ex-Belgian Peugeot 'Raudi'.

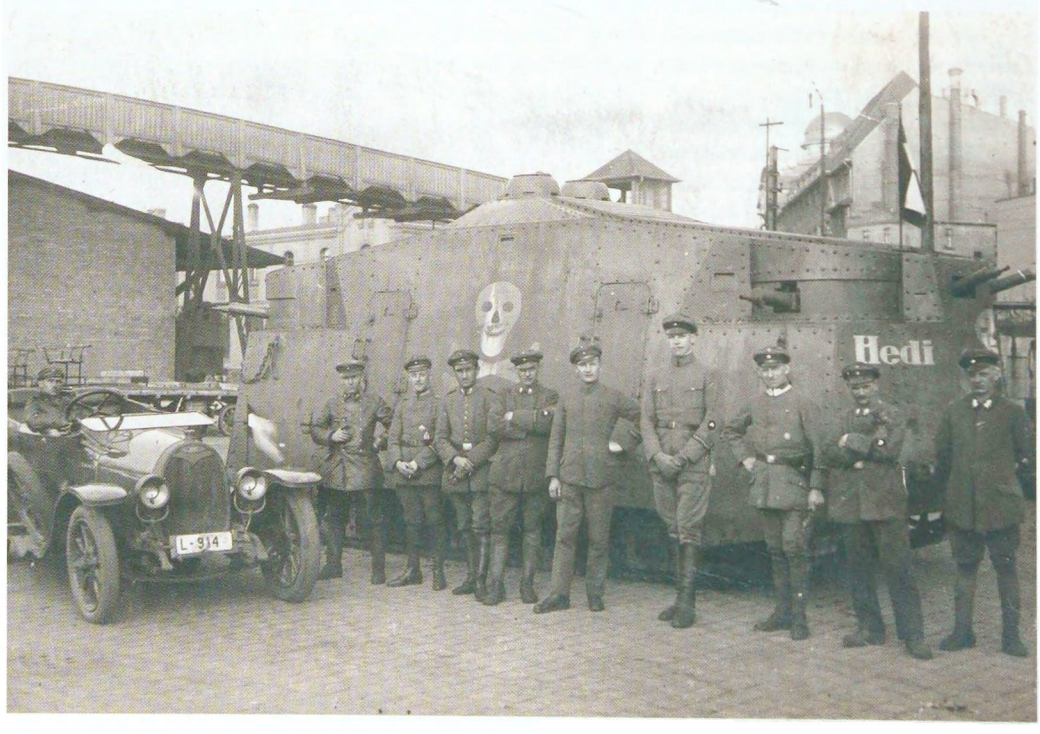
The 'L' refers to General von Lüttwitz to whose command Kokampf belonged. 'Strolch', 'Lotta' and 'Raudi' saw combat in Munich in early May. (Strasheim Collection)

The detachments were initially numbered 01, 02, and 03 – but became 101, 102, and 103 when *Kokampf* became an element of *Reichswehrgruppenkommando* 1. Detachment 104 had been planned to be a Bavarian unit but was never established. Two more detachments, 105 and 106, may have been formed or been under formation, but no further details are available.

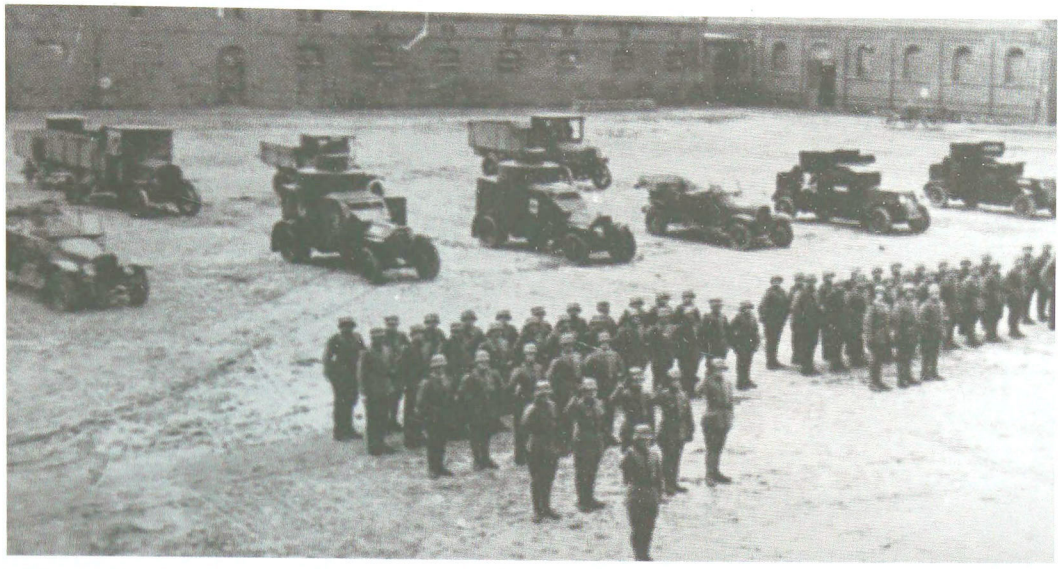
While 01/101 remained the detachment based in Berlin and using those vehicles known from photographs, 102 had its origins in the '*Armoured Detachment of Army Command North*' (augmented by *Kokampf*), and 103 was formed from '*Armoured Detachment of Army Command South*'. (Both army commands were *Grenzschutz Ost* formations, the former based in East Prussia, the latter in Silesia.)

Detachments 102 and 103 may have been deployed in support of the planned operation against Poland (to re-take the Posen province and smash the Polish army), which was prepared but never executed after the terms of the Versailles Treaty became known in early summer 1919. Detachments 101 and 103 were finally disbanded in Berlin, while 102 was demobilised in East Prussia. *Abteilung 103* is recorded in Silesia until 19 January 1920. The photographic account of 102 and 103 for 1919 still has to be discovered.

Yet tanks were only one facet of *Kokampf*. Just one of them, '*Hanni*', was used in combat during the March 1919 fighting in central and eastern Berlin. For countering internal unrest the weapons of choice were armoured cars, of which *Kokampf* possessed a motley array. Armoured cars were much easier to move around and their effect against an enemy usually armed only with rifles and machine guns was as good as that of tanks.



'Hedi' seen at Leipzig railway station in May 1919. Three tanks, 'Hedi' plus two Mk.IV females, had been given to General Maercker's Landesjäger-Korps for the pacification of Leipzig and Halle. They certainly added to the strength of the force, but saw no combat. The tall officer (fourth from right) is 2nd Lt Bornschein, a veteran of A7V Abt. 1. While the first man on the right displays the 'Grenzschutz Ost' collar emblem, four others wear the silver oak twig of 'Generalkommando Lüttwitz'. Skull badges and cuff titles marked 'Kampfwagen' are worn on the left sleeve. Note the 'Lüttwitz L' on the licence plate of the passenger car. Hedi's Kokampf plaque ('Kokampf – 151 – Abt. 01') is hardly visible behind the third man from right. The tank seems to be densely covered by soot. (Mario Doherr Collection)



The mailed fist of the Berlin-based Garde-Kavallerie-Schützen-Korps in late spring/early summer of 1919: Two ex-Italian Lancias (at left) and two ex-Russian Austins (third pattern). Normally, two vehicles were in service with Garde-Kavallerie-(Schützen)-Division and two with Division von Lettow. The vehicles display no Kokampf markings, yet the personnel serving them regularly are seen wearing 'Kampfwagen' cuff titles and skull badges. The Garde-Kavallerie-Schützen-Korps was disbanded in June/July 1919, but 2nd and 3rd Naval Brigades (previously units of Div v.Lettow) lived on until May/June 1920. (Strasheim Collection)

The man sitting in the centre is Kapitänleutnant (Naval Lt) Lothar von Arnauld de la Perière, the highest scoring submarine commander in history, seen here as commander of the assault battalion of 3rd Naval Brigade ('Marinebrigade') within Division von Lettow (also known as 'Marine-Division'). Again, a Lancia and an Austin are prominent. The Lancia shows the plaque 'S-GS-52' on its bonnet. Some months later, in April 1920, von Arnauld's unit participated in the subjection of the Red Ruhr Army. After this operation three armoured cars still belonged to the unit: a Lancia 'Enzio', a Russian Fiat/17 'Lottchen', and a Russian Fiat/15 (ex-'Strolch', no name visible). A fourth vehicle, 'Lotta', had been lost in combat. (Strasheim Collection)

The Germans had only produced a rather limited number of armoured cars during the war, which had seen very little or no combat use but had travelled far and wide, some even to the Caucasus and the Baku oil fields. And they had captured a large number of armoured cars, the majority in Russia and Italy, some of which had been used to form additional armoured car units (none of which saw combat).

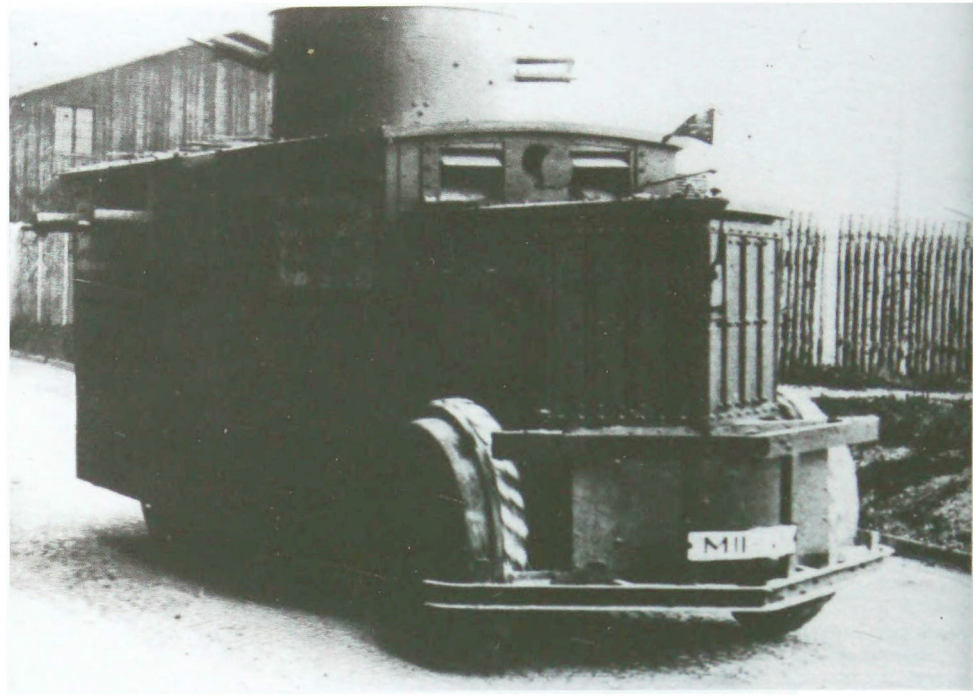
In early 1919 *Kokampf* had only one indigenous German armoured car, an Ehrhardt, plus some makeshift armoured lorries of 1919 vintage, all their other armoured cars being captured vehicles. (The motor vehicle replacement depot at Berlin-Schöneberg had been the central collecting point for captured armoured cars).

After the Versailles Treaty was signed on 28 June, the Allied Military Control Commission, which finally moved into Berlin on 15 September 1919, demanded the scrapping of all tanks and decentralisation of Kokampf's fleet of armoured cars. Subsequently several tanks were scrapped in Berlin. Others may have gone into hiding.

Essentially, 'decentralisation' became a thinning of *Kokampf's* armada by giving armoured cars to some of the *Reichswehr* brigades now being formed, where they comprised the '*Leichter Kampf-Kraftwagen-Zug*' (light armoured car platoon) with two combat vehicles. The personnel (when coming from *Kokampf*) usually kept their '*Kampfwagen*' cuff title and the skull and crossbones badge, and because of which the platoons are often misidentified as '*Kokampf*'. However, *Kokampf* remained the central body for swapping vehicles and personnel – and retained the heavy detachments 101, 102 and 103.

Not all brigades had armoured cars, and those which had did not strictly adhere to the number of two, and some acquired their armoured vehicles from sources other than *Kokampf*. For example, the Bavarian Brigade 21 (former *Freikorps Epp*) possessed six armoured cars: four specially built for them, one ex-Italian Lancia, and one Daimler makeshift armoured truck.

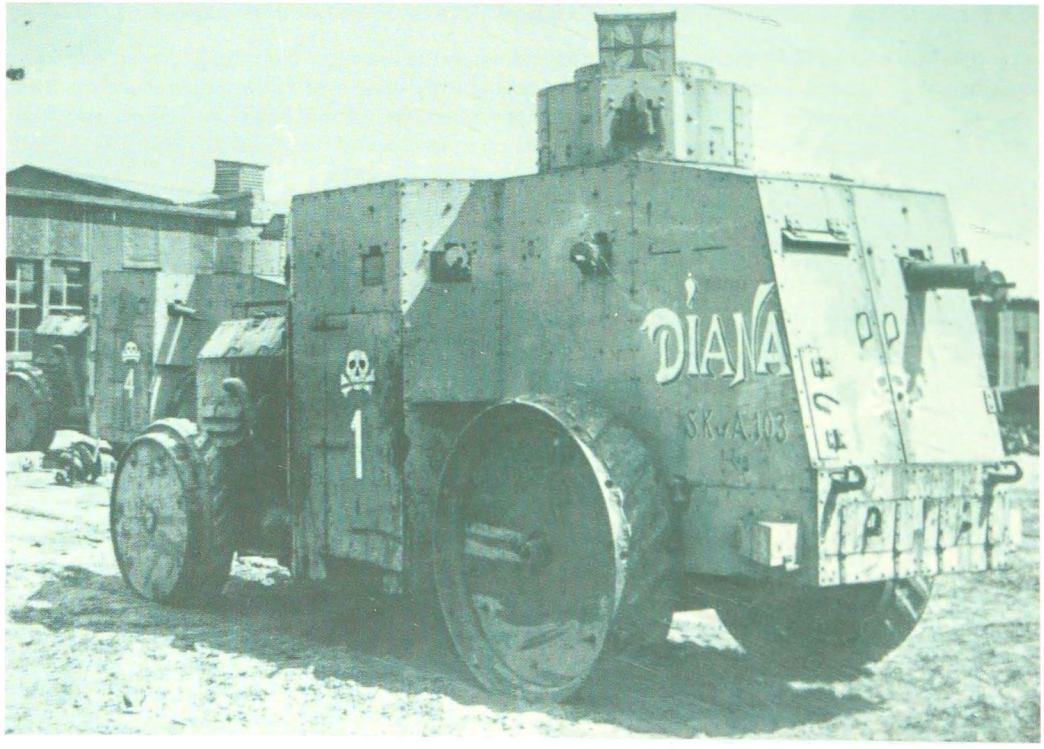
The Württemberg Brigade 13 fielded three armoured cars for the 'liberation' of the Ruhr district in April 1920 – and had at least one Mk IV female tank "hidden at home."



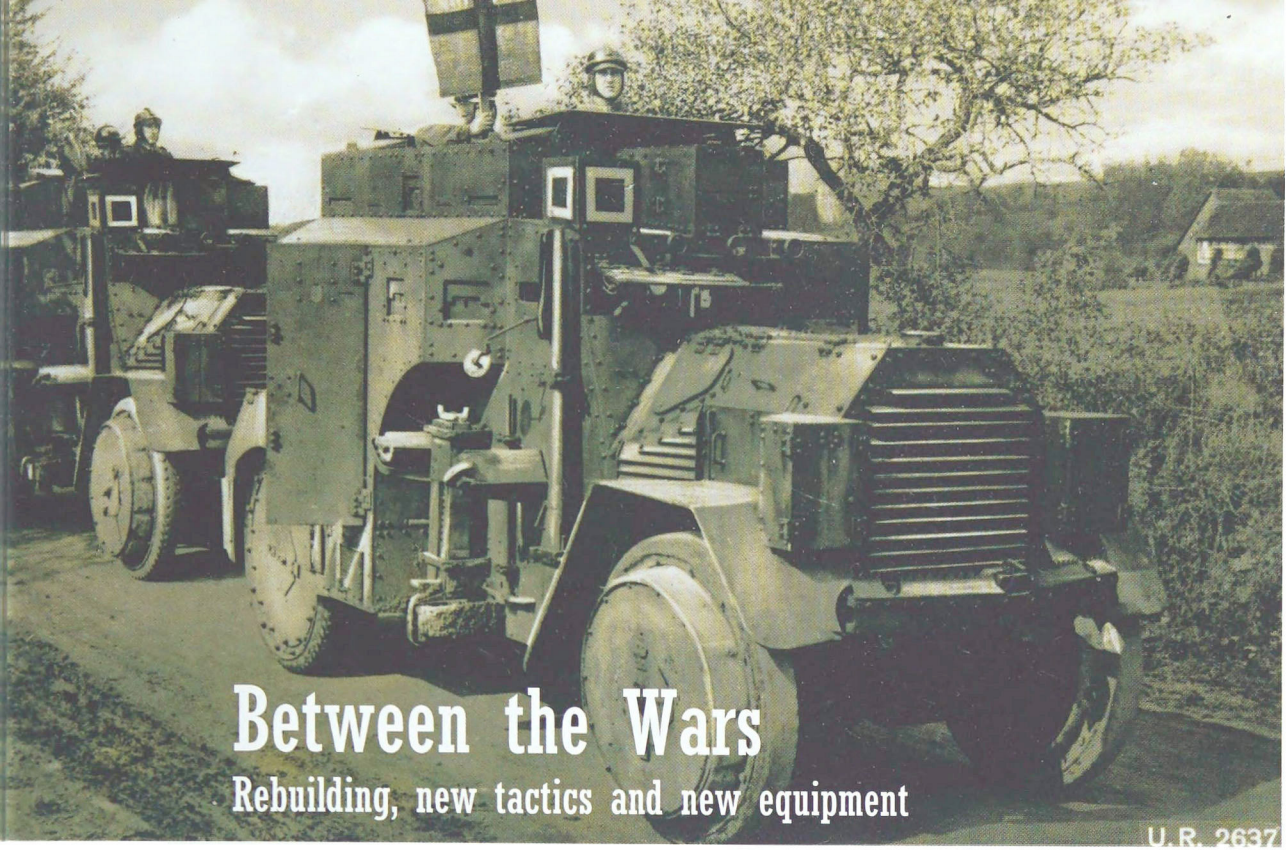
The Bavarian special solution: an armoured car of Freikorps Epp. Constructed (like the D.Z.V.R.) on the chassis of the 100 HP Krupp-Daimler tractor, the vehicle had a crew of twelve and fielded a 3.7 cm gun (in the turret) and seven 08 machine guns (two per side, one rear, one in the turret rear and one reserve). Four of these monsters were ordered, but only one (licence plate: M II 619) became ready in 1919. The completion of the three others dragged on until mid-1920 as the factory workers were well aware of the potential use of the vehicles and thus saw no reason to hurry. The plaques (apparently covered with mud here) read: 'Vom Kampfwagen abbleiben, sonst wird geschossen!' (Stay away from armoured car, else fire will be opened!) Note the black flag with skull and cross bones on the bonnet. A small black rhombic dot denotes the Freikorps Epp Lion emblem below the forward plaque. The overburdened vehicles could only be used 'at moderate speed and on good roads.' (Strasheim Collection)

In early 1920 the new Krupp-Daimler D.Z.V.R. and additional Ehrhardt armoured cars started to arrive in numbers. They very soon replaced the foreign and makeshift vehicles, which must have been a mechanical engineer's nightmare in terms of spare part procurement. As the Versailles Treaty forbade armed armoured cars for the emerging *Reichswehr* (but in the Boulogne appendix of 22 July 1919 allowed 150 of them for the Germanpolice), about 50 vehicles were handed over to the police forces of the German '*Länder*' (states) until the end of 1920.

On 30 May 1925 the Allied Military Control Commission published its final paper on German arms and equipment delivered or destroyed under the terms of the Versailles Treaty. According to this report, 59 tanks had been delivered. This number, however, did not include the bulk of the tank detachments parked at Erbenheim race course in November 1919. Those tanks – and others possibly still on the railway destined for Erbenheim or Gustavsburg – were captured by the advancing Allied forces. French forces occupied the Wiesbaden bridgehead (that incorporated Erbenheim and Gustavsburg) on 15 December 1919.



Two Krupp-Daimler D.Z.V.R. of Schwere Kampfwagen-Abteilung 103 seen approximately at the time of the Kapp revolt in March/April 1920. By that time, detachment 103 was back in Berlin and re-equipped with the 'modern' D.Z.V.R. armoured cars. The vehicles had a crew of six and normally carried two 08 machine guns. Six more men could be transported for dismounted action. High fuel consumption was a limiting factor for D.Z.V.R employment. The small letters below S.Kw.A.103 read '1.Zug' (first platoon). Kokampf sided with Herr Kapp and General von Lüttwitz during the revolt, a fact that certainly promoted the rapid disbanding of the unit in early summer of 1920, not least because the industrious Hptm. Körting was relieved from his position in the wake of the unsuccessful insurrection. (Strasheim Collection)



Two Kfz 3 of the Reichswehr out on an exercise some time before 1933. These heavy cars were forbidden to be driven off hard surfaces, and were only supposed to be personnel carriers, though it seems likely that rifles could be fired through their many vision ports. Their camouflage colours are already quite subdued in comparison to those of World War I. (Prigent Collection)

Between the Wars

Rebuilding, new tactics and new equipment

by John Prigent

AS MENTIONED in the last chapter, the Treaty of Versailles imposed severe restrictions on German forces. This was not just a matter of banning tanks and slashing the size of the army and navy to 100,000 officers and men; warplanes (previously forming a part of the army) and heavy artillery were forbidden, and even the famous General Staff organisation was to be disbanded. An infantry division could now have no more than 11,240 men, including officers, and a cavalry division no more than 5,525. The Allied Commission enforcing the Treaty's provisions seized much equipment but allowed a few armoured cars to be retained by the Police. Some tanks and armoured cars were kept by the *Freikorps* as well for a short time.

The old Imperial Army ceased to exist and the new *Reichswehr* replaced it in March 1919, permitted under the Treaty only as a border guard force and to prevent civil disorder. The army was thus not immune from the turmoil of the immediate post-war years, and in fact was forced to contribute to it by discharging so many men when there were no jobs for them to go to. Inflation was rampant, with even postage stamps needing to be denominated in thousands of Marks and then hundreds of thousands. Hans von Seekt, commander of the General Staff, effectively evaded its forced dissolution by simply transferring many of its sections to other departments and maintained its heart, the Operations Section, under the innocuous new name of *Truppenamt* or Troops Office.

He also set up no fewer than 57 study groups to consider the lessons of the late war, with well-respected high-ranking officers appointed to them. Everything was to be analysed and recommendations made for the future, from basic infantry tactics to the military weather forecasting service. Tanks were not neglected in these studies; even though Germany was no longer allowed to have any, their effectiveness and tactics in the war were to be examined and future tank types and tactics considered.

As a result of all these studies new tactical regulations were issued in 1921, ignoring the absence of tanks, artillery and air power and instead setting out how they were to be used by Germany or countered if used by an enemy. The expressed intention was to provide the German army with doctrines that would apply to a modern army possessing them. Clearly it was already thought that the Treaty restrictions would eventually fall away.

Troop training in anti-armour tactics and in cooperation with tanks was obviously going to be difficult when there were no tanks to train with. The solution was to build dummy tanks. Some were very flimsy, mere constructions of canvas on wooden struts to be used for target practice and mounted on skids so they could be moved around the exercise grounds. Others were more mobile, mounted on bicycle wheels. These were probably also mainly used at targets, though they may also have been trundled around to familiarise troops with the appearance of a tank attack – almost certainly without any live ammunition being fired at them!

At a later stage of the development of these '*Panzerattrappes*' (literally 'tank mockups, or dummies') they became motorised. Many were simple constructions that could be fitted to light car chassis after removing their passenger bodies, with turrets mounting dummy machine guns. Others were more permanent, even

These very early Panzerattrappes are thought to have been photographed at Sennelager in the early 1920s. They are not very mobile, most being on skids though one has wooden wheels, and were used as targets for anti-tank rifle practice. It is interesting to compare their shapes with the Kfz 3 armoured car of the same period. (Prigent Collection)

having fixed steel bodies and actual machine guns. This type was clearly very useful for training future potential tankmen in tank tactics without using actual tanks.

The progress made in developing new unit organisation, tactical doctrine and training was quite considerable, but the manpower restriction was a great hindrance if Germany was to rebuild a significant fighting force. Conscription was forbidden by the Treaty, and minimum enlistment was required to be for 12 years, so there was no possibility of simply cycling large numbers of short-term conscripts through the training each year to build up a reserve of trained manpower. However, there was a loophole in the Treaty provisions – there was no limit on the number of NCOs. This gave the *Reichswehr* an opportunity that was seized upon, and by 1926 it had more chiefs than indians with only 36,500 privates in its 100,000 strength! These NCOs were given far more responsibility than in other armies, many being given positions such as platoon leader that in other countries would have been held by officers. When the *Reichswehr* became the *Wehrmacht* under Hitler many of them became officers in the expanded army.

The dummies mounted on bicycle wheels had a very light construction, just canvas over a wooden frame, so they could be moved easily. These were photographed in Bavaria on the mid to late 1920s and their shape is now much more tank-like, with imitation tracks and turret mounting a dummy machine gun. (Prigent Collection)

Meanwhile, ideas for new tanks and other fighting vehicles were being put forward and solutions sought to the problem of developing them 'illicitly' without detection by the Allied Commission enforcing the Treaty provisions. Some vehicles were built in secret and tested in Soviet Russia, with the German designers and engineers moving abroad to do their jobs. Others were simply claimed to be intended as agricultural or cargo-hauling tractors and produced without armoured superstructures or turrets – though, oddly for use on farms, with armour hulls which would have betrayed their true purpose if the Commission had spotted them.

Tactically, however, the *Reichswehr* was following the same trail as other armies, with an emphasis on lightly-armed tanks to operate against infantry. Its officers were encouraged to travel abroad and see whatever

they could of foreign armies' exercises – they were often welcomed as observers – and the result was that since almost everyone else was thinking in terms of the 1918 fighting, so did they. Light tanks and unturreted tankettes armed only with machine guns were the common approach to the attack on infantry, the theory being that their potential numbers could simply swamp the defences and their speed would allow exploitation of the resulting gaps in enemy lines. Heavier tanks would be needed in smaller numbers, some with anti-tank weapons to destroy enemy light tanks and some with 7.5 cm guns firing high explosive shells to attack artillery and fortified positions. The tank was still seen as merely a support for the infantry's attacks by authorities such as Volckheim (one of Germany's few officers with tank experience in World War I) and by Fuller in Britain.

A paradigm shift took place when it was realised that a medium tank with machine guns plus an anti-tank weapon could both attack infantry and dispose of enemy tanks. Far-sighted officers like Guderian in Germany and Liddell Hart in Britain expressed different ideas, calling for more gun-armed tanks and devising tactics for their use in attack and defence, and practical experience during exercises with the few 'heavy' tanks available showed the correctness of this approach. Nevertheless economic factors held sway and the cost of such tanks was too high during the depression of the 1930s so machine gun-armed light tanks continued to be built in large numbers for most armies.

These two Panzerattrappes were seen at Juterbog, a base near Berlin, on 12 November 1933. They look much more like tanks, but are still only mounted on skids. (Prigent Collection)

Tactics

A number of standard formations were devised for the *Panzerwaffe*. Long journeys were, as far as possible, made either by rail or on trucks and trailers; the light weight of the early Panzers meant that heavy trucks could easily carry one tank and tow a trailer with a second. Long marches on tracks, such as that to Vienna during the *Anschluss* described in the next chapter, produced very high numbers of breakdowns: engine or transmission failure, suspension and wheel problems, or simply track breakages. The technology of those days was simply not up to producing long life in these stressed components, though it improved rapidly in later years.

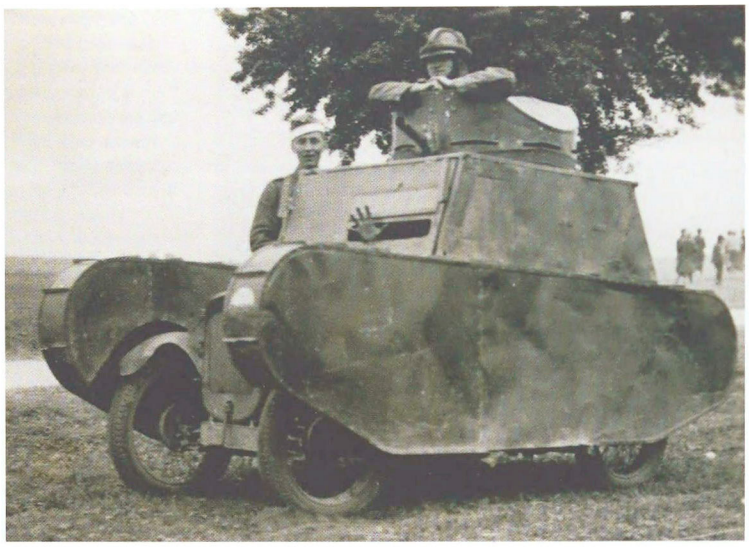
Tactical movement in formation fell into several stages. Approach marches across open country were made in company-strength columns, with the Panzers deploying into battle formation when still out of enemy firing range. Obviously this was an ideal, and long battalion or even regimental-strength columns were sometimes the only way forward when cross-country travel was impossible due to forests or marshes so an advance had to be remain road-bound.

There were several alternative battle formations; a company could deploy its platoons into line-abreast formations, into lines echeloned back to one side, or into arrowheads, either with gaps between them to extend the front or fairly close together. The company might in turn have the platoons in line, echeloned or in arrowheads, or have two platoons forward and one in reserve behind them. The same basic formations applied at battalion and regimental level too, and even to whole divisions. The actual choice of which formation to adopt was governed by the strength of an enemy position and the terrain obstacles.

There were several ways to conduct an attack: frontal assault, flanking attacks, a combination of those two with one being a feint to pin down the enemy, and straightforward envelopment if the enemy could be surrounded. Tactics for defence were primarily focussed on swift counter-attacks against any enemy penetration of German lines, using the same formations as for an attack.

In theory, Panzers were to be supported by infantry in close company – though this became a sore point during wartime combat, when escorting infantry sometimes failed to keep up or even failed to advance at all. The infantry was needed not just to hold the ground captured by the Panzers but also to spot enemy positions: vision from inside a buttoned-up tank is limited, so it was very easy for a Panzer commander to fail to see, for example, a camouflaged anti-tank gun position. Artillery was also supposed to be emplaced to support the Panzers' advance, firing from behind them and moving up later if unable to advance with them, and anti-tank guns were to be alongside the Panzers to guard their flanks against enemy tanks.

In practice, experience showed that the Panzers outran their supports in mobile warfare because men on foot and horse-drawn guns simply could not keep up with them. This led to the development of *Schnelltruppen* (fast troops) infantry mounted in trucks, bicycle infantry and motorcycle infantry. Their cross-country mobility was still limited, so halftrack personnel carriers were built that could keep up with the Panzers across most terrain. Motorised guns also had problems across country, and self-propelled guns on tracked chassis were the eventual answer for both field guns and anti-tank guns. The *Panzer Division* of the later wartime years was a far cry from that of 1939, as will be described later in this series. For now, it



By 1935 dummy tanks were being mounted on light car chassis. This one is seen in the Nuremberg manouvres of 1935 and seems to be simply put over the normal car body. The early 'crash hat' for crewmen is still in use but would soon be replaced by a large black beret worn over a padded helmet. The experimental tactical marking presumably indicates a tank unit, though it does not follow the rules for those applied to the actual Panzers. (Prigent Collection)

suffices to say that most of the German army was still on foot or on horses until after the end of the campaigns in this book.

Tank development up to 1939

There were a number of experimental designs during the 1920s and early 1930s, some total failures and others built as prototypes. One, intended as an armoured ammunition carrier, was rejected for that role but resurfaced during the war on the Russian Front as a radio-controlled chargelayer for destroying enemy bunkers. Although fascinating to study, none saw service as tanks so the following brief descriptions will be confined to those that did. It is noteworthy that none of the pre-1939 German tank designs were armoured to resist anything more than small-calibre amour-piercing bullets from rifles and machine guns! The theory was that they would be attacking infantry, with only a few anti-tank weapons to be worried about which would be suppressed for them by artillery. The drawbacks of this approach were to become very evident when they had to face hostile tanks and determined anti-tank gun opposition.

The production tank chassis were also used for a number of special vehicles: self-propelled anti-tank guns, self-propelled artillery and bridgelayers. Since none of these were used until 1940 their description will be left for the next volume in this series.

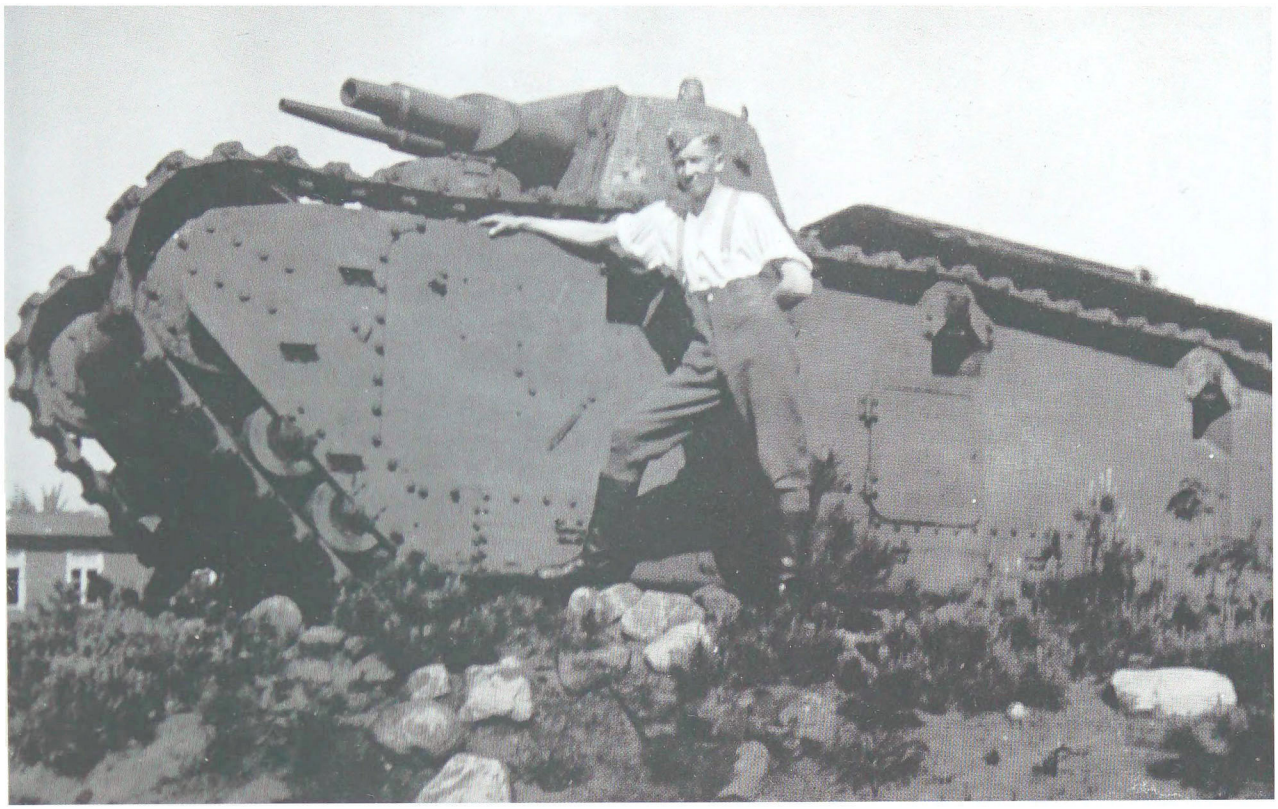
The *Grosstraktor*

The first specifications for a heavy (in the terms of those days) tank had been drawn up by 1926. Its code-name simply meant 'large tractor'. It was to have a short 7.5 cm gun and co-axial machine gun in a fully rotating turret, a second machine gun in the hull front, and a third in a small separate turret at the rear of the hull. Contracts were given to Krupp, Rheinmetall and Daimler-Benz to design and build two prototypes each in mild steel. Secrecy was maintained throughout, though if the Commission had found out about them the argument might have been made that they were only mild steel so not subject to the Treaty ban on tanks. All six were ready in 1929 and were shipped to Kazan in the Soviet Union for testing, and went through several stages of modification both there and after their return to Germany in 1933. Although they were not enormously successful designs, with faults in their suspensions and tracks accounting for a number of the changes made, they did serve to test ideas and in fact the four runners among them took part in the first exercise of the newly created *Panzer Division* in 1935 before being retired to serve as barracks 'monuments'. Photographs show some intriguing modifications after their return to Germany: one was fitted with a dummy long-barrelled 7.5 cm gun, perhaps merely to make it look more impressive, and another was modified to mount a dummy 3.7 cm gun beside the short 7.5 cm. This seems likely to have been a 'proof of concept' trial by Krupp to see if the proposed mounting of this combination in their turret for the *Neubaufahrzeug* tank, that was being designed in 1933, would actually be workable. The intention was to provide it with both an anti-armour weapon, the 3.7 cm being a good anti-tank gun at the time, and an anti-personnel and anti-artillery weapon in the short 7.5 cm with its high explosive ammunition.

This is a Krupp Grosstraktor as a barracks monument. It has been fitted with a dummy main gun, but shows the position of its hull machine gun – which is a long way forward of the hull gunner's head cover and has no gunsight opening. Thus it cannot have been easy to fire and must have been impossible to aim. (Prigent Collection)

The *Neubaufahrzeug*

The *Neubaufahrzeug* design, or NbFz for short, began life in 1932 as the *Mittlere Traktor* or 'medium tractor', still keeping up the pretence that tank designs were for agricultural or road haulage vehicles. A year later its name changed to *Neubaufahrzeuge*, or 'new build vehicle' which was even more cryptic. Like the *Grosstraktor* it was to mount a short 7.5 cm gun firing high explosive shells, but this time with a co-axial 3.7 cm anti-tank gun and a machine gun beside it in the turret and with not one but two subturrets mounting machine



One of the Rheinmetall Grosstraktors was fitted with a coaxial 3.7 cm gun beside its 7.5 cm. Both appear to be dummies, and this may have been a test for the coaxial 7.5 cm/3.7 cm mounting of the NbFz. It is in a single-colour finish, possibly feldgrau. (Prigent Collection)

A Daimler-Benz Grosstraktor seen as a barracks monument for II Abteilung, PzRegt 8 at Wunsdorf in April 1939. It is still in the three-colour scheme but has been fitted with a long-barreled gun which appears to be a dummy 7.5 cm. It is unknown whether this was done merely to make the monument look more impressive or as part of a test of possible mountings for a proposed tank gun version of the long-barreled 7.5 cm anti-tank gun that Rheinmetall had begun developing in 1935. (Prigent Collection)

This is an LaS of PzRegt 6 at Zossen, near Berlin, in 1935. Although obviously a forerunner of the Pz I Ausf A, it has air cleaners in the crew compartment and a completely different engine deck with large hoods through which the exhaust pipes ran to the silencers. It is painted overall feldgrau (Prigent Collection)

guns, one in front of the main turret and one right behind it. This time only Krupp and Rheinmetall were asked to submit designs, and the Rheinmetall hull was chosen Two NbFz were built in mild steel during 1934, one with a Rheinmetall turret design and one with a Krupp-designed turret. The Krupp turret had the 3.7 cm gun beside the 7.5 cm and the Rheinmetall one above it – not a position where loading it would exactly be easy, though it did eliminate parallax errors in sighting. The Rheinmetall turret was also quite different in appearance, being rounded rather than flat-sided, and had a very bad shot trap in its rear-hinged side hatches. In general it is regarded as a bad thing to have a hatch that opens like this. Opening such a hatch under fire will immediately let shots ricochet inside, and also force the occupants to expose themselves as soon as they try to get out, instead of having the open hatch for partial cover between themselves and the enemy. After initial tests, three more NbFzs were built, this time in armour steel and all with the Krupp turret. They were used in the 1935 *Panzer Division* exercise and also in the 1940 invasion of Norway.

THE *PANZERKAMPFWAGEN* I

The origins of the Pz I were in the 1930 concept of the *Kleintraktor* or 'small tractor', a codename used to conceal its true intended use for military purposes. At this point it was not a tank but a scouting or weapons-carrier vehicle. In 1933 it was renamed *Landwirtschaftlicher Schlepper* (LaS for short, and meaning 'agricultural tractor'), still maintaining the pretence that it was not a military vehicle because the Versailles Treaty had not yet been repudiated by Hitler, and it only became Pz I in 1936. The *Kleintraktor* design used a suspension partly based on reverse-engineering of what could be seen in photographs of the British Carden-Loyd Light Tractor, and a Carden-Loyd was bought later and used for comparative trials. The *Kleintraktor* prototype chassis was built by Krupp and tested in July 1932, and a further five with improvements were ordered. Following further tests an initial production series of 150 were ordered in July 1933, 135 from Krupp and three each from five other firms. They were now under the LaS designation and built as chassis only, without superstructures or turrets. These were used as driver training vehicles after attempts failed to fit them with both items – probably the origin of Guderian's claim that the Pz I was originally only intended for training, not for combat. Since the hulls of this first series were built of armour steel it is clear that they were intended to fight; mild steel would have been cheaper and perfectly adequate for training vehicles.

A Pz I Ausf A seen on a test run in May 1936 at Nuremberg. It is from the first production series of machine gun tanks, shown by the vision port in the superstructure rear, and carries the three-colour camouflage scheme. (Prigent Collection)

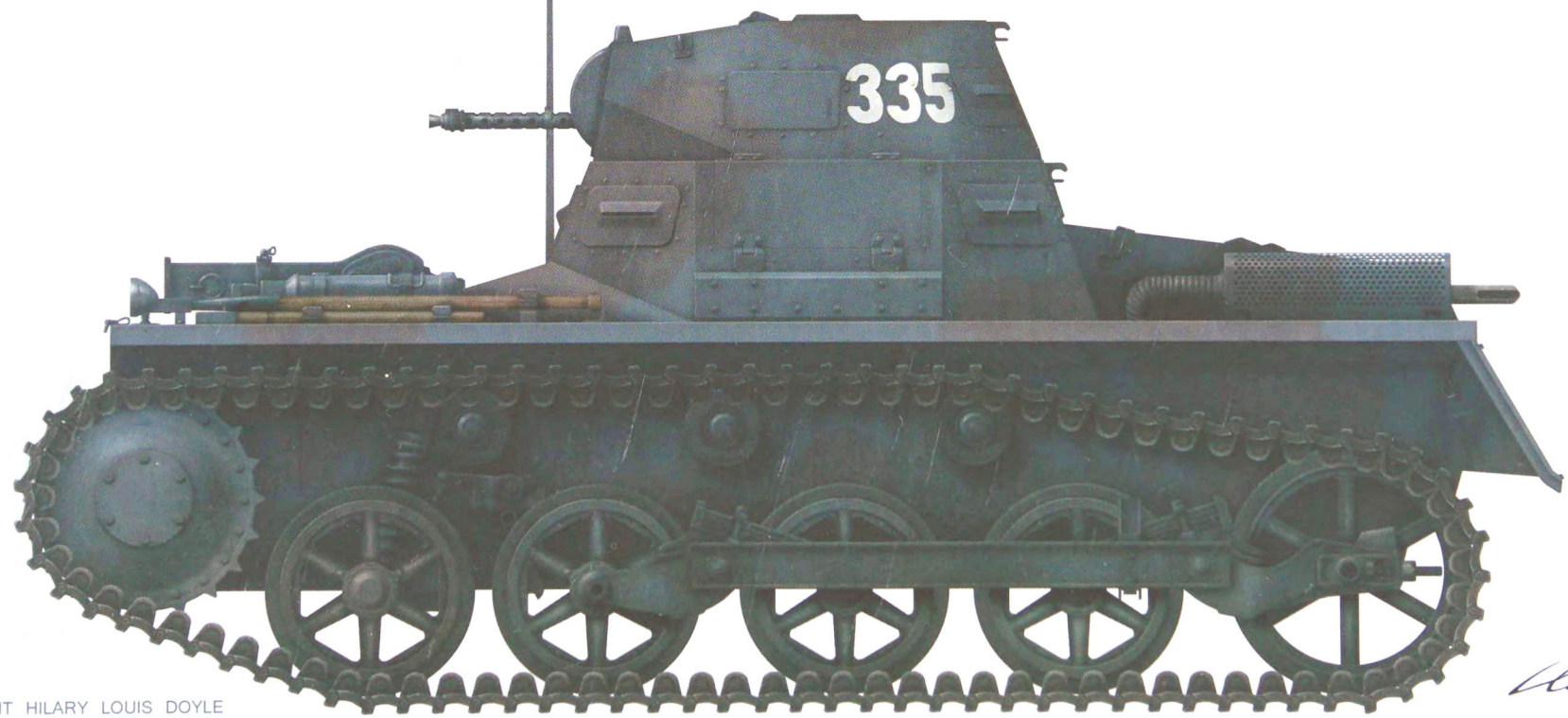
These Pz I Ausf A carry the 1937 type of tactical markings applied for exercises. Unfortunately the unit, believed to be PzRegt 4, did not follow the official specifications and the precise meanings of their variations are not known. (Prigent Collection)

Panzerkampfwagen I

Weight: 5.4 tonnes
Crew: 2
Engine: Krupp M305 3.5 litre, 60 HP
Speed: 37.5 kp/h
Armament: 2 x MG13k 7.92 mm MGs
Length: 4.02 m
Width: 2.06 m
Height: 1.72 m
Armour: 5 to 15 mm

A parade of Pz I Ausf As of PzRegt 2 at Eisenach, probably photographed in 1938

They show their grey and brown camouflage patterns, which are different on each tank. They also show a patch of new paint on the rear of each turret where the previous exercise markings have been painted out, to be replaced by a white Panzer rhomboid and small figure 2 on the backs of their superstructures. (Prigent Collection)



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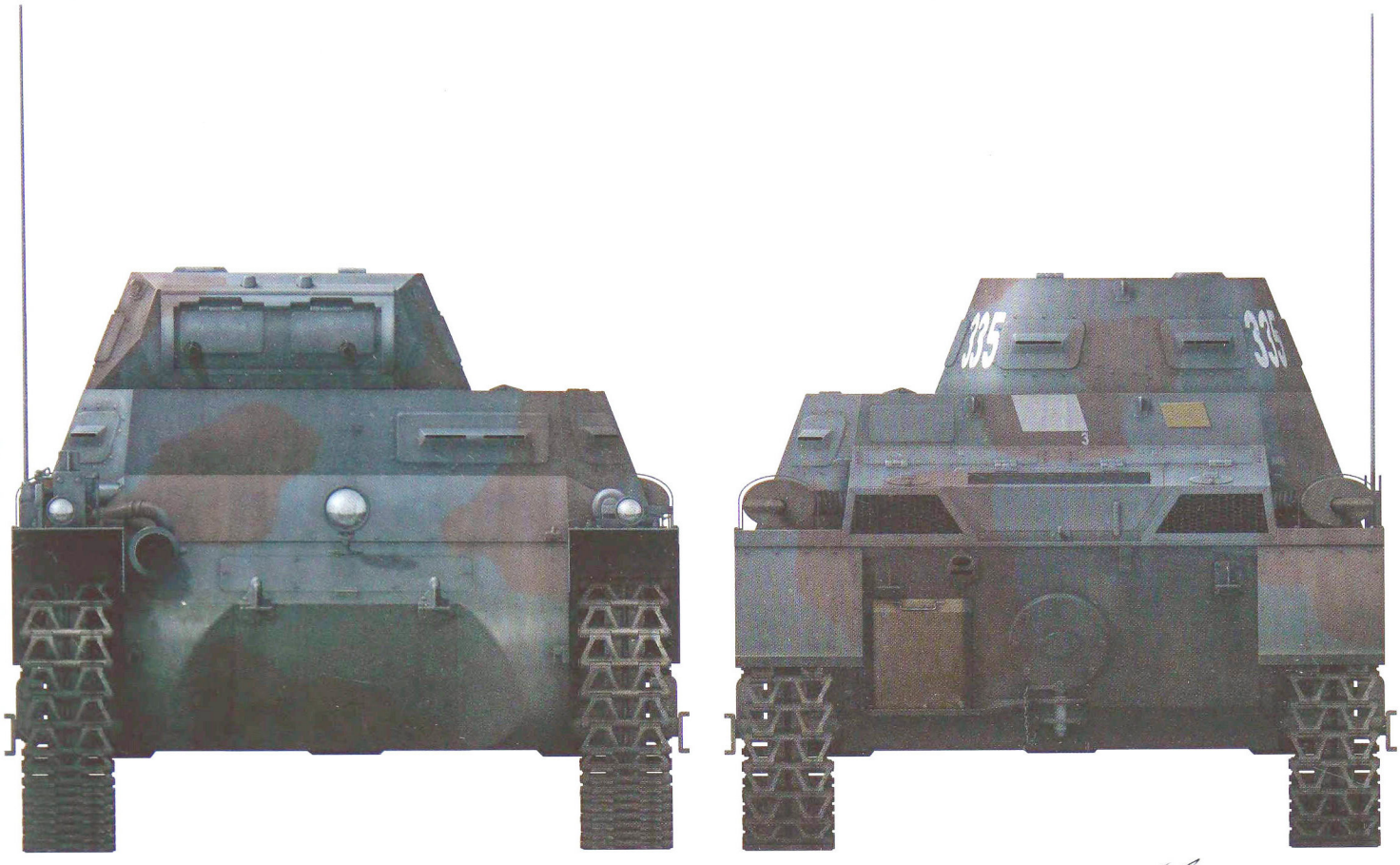

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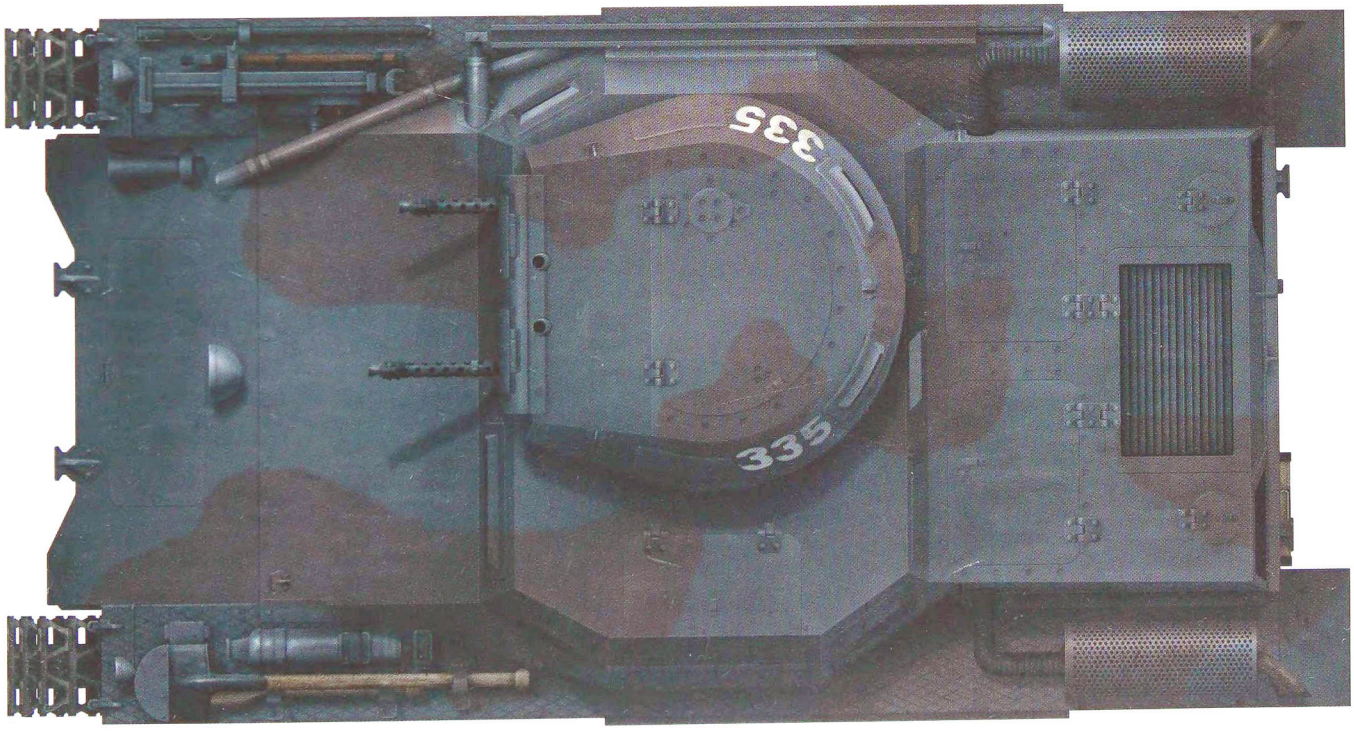

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This kleiner Panzerbefehlswagen on Ausf B hull was fitted with an experimental frame aerial for its radio. It has no machine gun yet, due to a shortage of mounts for them, and carries the three-colour camouflage scheme. (Prigent Collection)

Further orders were placed for tanks with improvements that had been found necessary while the first 150 were in use. This time they were to be complete with superstructures and turrets, which were to mount twin machine guns. Nearly 1,200 were built by Krupp, Grusonwerk, MAN, Rheinmetall, Henschel and Daimler-Benz, with production ending in December 1935. But the Pz I was not completely satisfactory as it stood, even with the improvements made, because its motor was underpowered and its trailing idler wheel (that met the ground like the road wheels) allowed the track to be thrown off the wheels too easily. It was therefore decided to change the motor from the original air-cooled Krupp type to a water-cooled one from Maybach. Its radiator and fan were placed beside the motor, needing only the same space as the Krupp motor, but the hull was lengthened at the rear to let the air flow freely through them and out of a new vent in the hull top. The idler wheel was also changed to a smaller one raised off the ground. Nearly 400 of this new version were built in 1936 and 1937 and designated Pz I *Ausführung* B – the original type of course then becoming Pz I Ausf A.

A few Ausf A were converted as *kleiner Panzerbefehlswagen* (small command tanks) with the original turret replaced by a small fixed turret of about the same size, and used in the 1935 exercises that saw the first trials of a complete *Panzer Division*. Some, though not all, had 'frame' aerials fitted for their longer-range radios while others relied on the normal rod aerial. These command tanks proved useful, so over 160 were ordered to be built on the improved *Ausf*(Model) B hull. These had wider fixed turrets, extending right to the port side of their superstructures, and some were experimentally fitted with frame aerials.

THE *PANZERKAMPFWAGEN* II

In July 1934 contracts were awarded to Krupp, MAN and Henschel for prototypes of a new tank in the 10-tonne class, to be armed with a 2 cm machine cannon and a coaxial machine gun. Secrecy was still being maintained, so the codename given to it was Las100 though it soon became retitled as *Panzerkampfwagen* II. The MAN vehicle was chosen as the best design and several short test series were built between 1934 and 1937. *Ausführungs a1, a2, a3* and b were very similar, with six small wheels in pairs each side all connected with an external beam like that of the Pz I. The Ausfs a all had the same power plant, but the *Ausf* b had a new engine which meant a slightly longer hull. Then, in 1937, the *Ausf* c appeared with a new suspension of five larger, independently sprung, wheels and thicker frontal armour. These improvements were adopted for the *Ausfs A, B* and *C* built from 1937 to 1940, only small internal improvements distinguishing them from each other. Many were retro-fitted with extra bow armour, giving their hull fronts a square appearance to replace the earlier rounded bow, and with episcope-equipped cupolas to improve vision for their commanders; some were built with these features. Then, in 1938, Daimler-Benz was asked to design a new

A Pz II Ausf a. Its guns have not yet been fitted. (Prigent Collection)

This Pz II is probably an Ausf A or B. It has been back-fitted with appliqué armour on its hull and turret fronts and with a commander's cupola. It is in the grey and brown colour scheme although the boundaries between the colours are very faint and hard to see. Behind it is a SdKfz 250/8 Ausf B armoured ambulance with Red Cross markings. The photograph was probably taken in early 1940 before the French campaign. (Prigent Collection)

One of the Rheinmetall Leichttraktors was retired to serve as a barracks monument. It still bears its three-colour camouflage. (Prigent Collection)

Pz II that could maintain a higher top speed as equipment for the new *Leichte Divisionen* (Light Divisions) that were to support the *Panzer Divisions*. This had a new hull shape and a new suspension of four large roadwheels each side, and was produced in 1938 and 1939 as *Ausfs D* and *E* distinguished by their tracks – *Ausf* D had rubber pads on its links, while *Ausf* E had all-steel tracks.

THE *PANZERKAMPFWAGEN* III

The first glimmerings of the eventual Pz III came as early as 1928, when Krupp and Rheinmetall were given contracts to develop tanks in the 6-tonne class carrying a 3.7 cm anti-tank gun in a fully rotating turret and with a crew of three or four men. The project was codenamed *Leichttraktor* (Light Tractor) and each firm built two examples. In 1930 all four were shipped to Kazan in the Soviet Union for trials in secret (the Versailles Treaty was still in force so everything about them was top secret) and only returned to Germany two years later, in summer 1932. They went through further tests in the next few years, and a number of modifications to try out different suspension designs, and took part in the summer 1935 *Panzer Division* manoeuvres. All of this gave a great deal of useful experience in the internal layout that was necessary for successful operation of a medium tank, as well as its desirable size, and by June 1934 Krupp, Daimler-Benz, Rheinmetall and MAN had all been invited to submit proposals for a medium tank codenamed *Zugführerwagen* (Platoon Leader's Tank) – in short, ZW.

Trials chassis for two tanks were ordered from Daimler-Benz and for one from MAN, with one turret to come from Rheinmetall and two from Krupp. Two further chassis were ordered from Daimler-Benz, testing different suspension systems. The MAN chassis and Rheinmetall turret were not selected for production, but the three Daimler-Benz chassis were all ordered into limited production (with modifications after the tests of the trials chassis) as *Ausführungs* A, B and C of the Pz III. The A suspension used five roadwheels on coil springs each side, while B used eight small wheels on leaf springs arranged as two sets of four wheels each side and C had leaf springs cushioning a set of two at front and rear with a set of four in the centre. The C suspension was also produced in a slightly modified form for the *Ausf* D. All four versions were only produced in small numbers – 10 As, 15 Bs, 15 Cs and 30 Ds – but saw active service in the Polish campaign. In December 1938 the *Ausf* E went into production. This had yet another suspension version,

A Pz III Ausf A. The chassis number 60107, visible on the jack in the original print, allows its identification as a tank of PzRegt 5 in 3 PzDiv. (Prigent Collection)

Panzerbefehlswagen III D1 with tactical number B03 is seen ready for rail transport. Although most of its frame aerial is hidden, the ball-mounted machine gun beside the dummy 3.7 cm in its turret is enough to identify the type. Behind it is a kleiner Panzerbefehlswagen that has been fitted with a frame antenna as well as with a commander's cupola. (Prigent Collection)

This is a Pz III Ausf B, the only version with round hatches on the hull front for servicing the brakes. The new suspension used shock absorbers mounted close together in pairs. (Prigent Collection)

A Pz III Ausf D with tactical number 431 shows the third version of this suspension and the longer hull at the rear. (Prigent Collection)

A Pz IV Ausf C shows the construction of its hull front and the tactical sign for a Panzer unit, not often seen on tanks. (Prigent Collection)

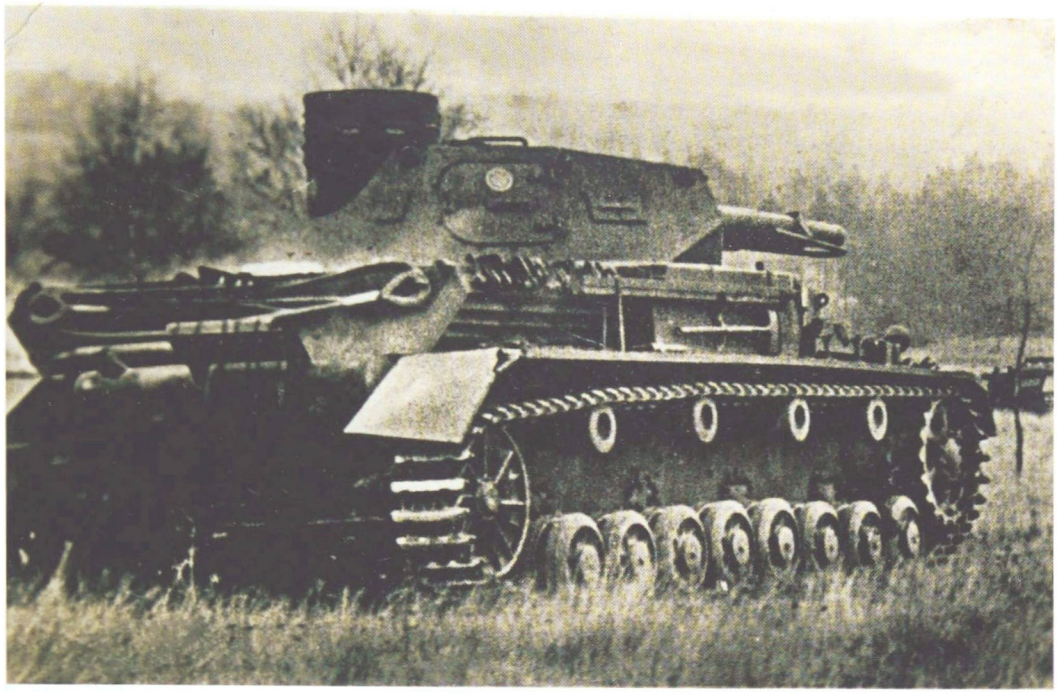
with six larger roadwheels each side mounted on torsionbars. The improvement was so great that nearly 100 were built and this remained the suspension for all future Pz III production. *Ausf* E had the same armament as the earlier variants, but its armour was doubled to 30 mm thickness from the 15 mm of the earlier versions. Like the Pz I, the Pz III was built as a command tank; the D suspension was used so it was designated *Panzerbefehlswagen* III *Ausf* D1.

THE *PANZERKAMPFWAGEN* IV

The Pz IV had its genesis in 1935 with the *Begleitwagen* ('escort vehicle'), or BW, that Rheinmetall was asked to design. A mild steel chassis was built, but it proceeded no further. Its suspension, copied for that of NbFz, was not particularly successful so an alternative Krupp design was chosen instead for a further two prototypes, imaginatively codenamed *Begleitwagen* I and II. Prototypes of both were built by Krupp in 1936 to test alternative suspensions: BWI with eight roadwheels in spring-mounted pairs each side, the arrangement adopted for the eventual Pz IV, and BWII with three pairs of larger roadwheels each side. The BWI was successful and, after extensive detail modifications to the design, was put into production as the Pz IV in late 1936 with the first production tanks being accepted nearly a year later. It is worth noting that the BW code designation misled Allied intelligence reports into describing the Pz IV as the '*Batallionführerwagen*' or Battalion Commander's Tank, a name that has been mistakenly copied in many books.

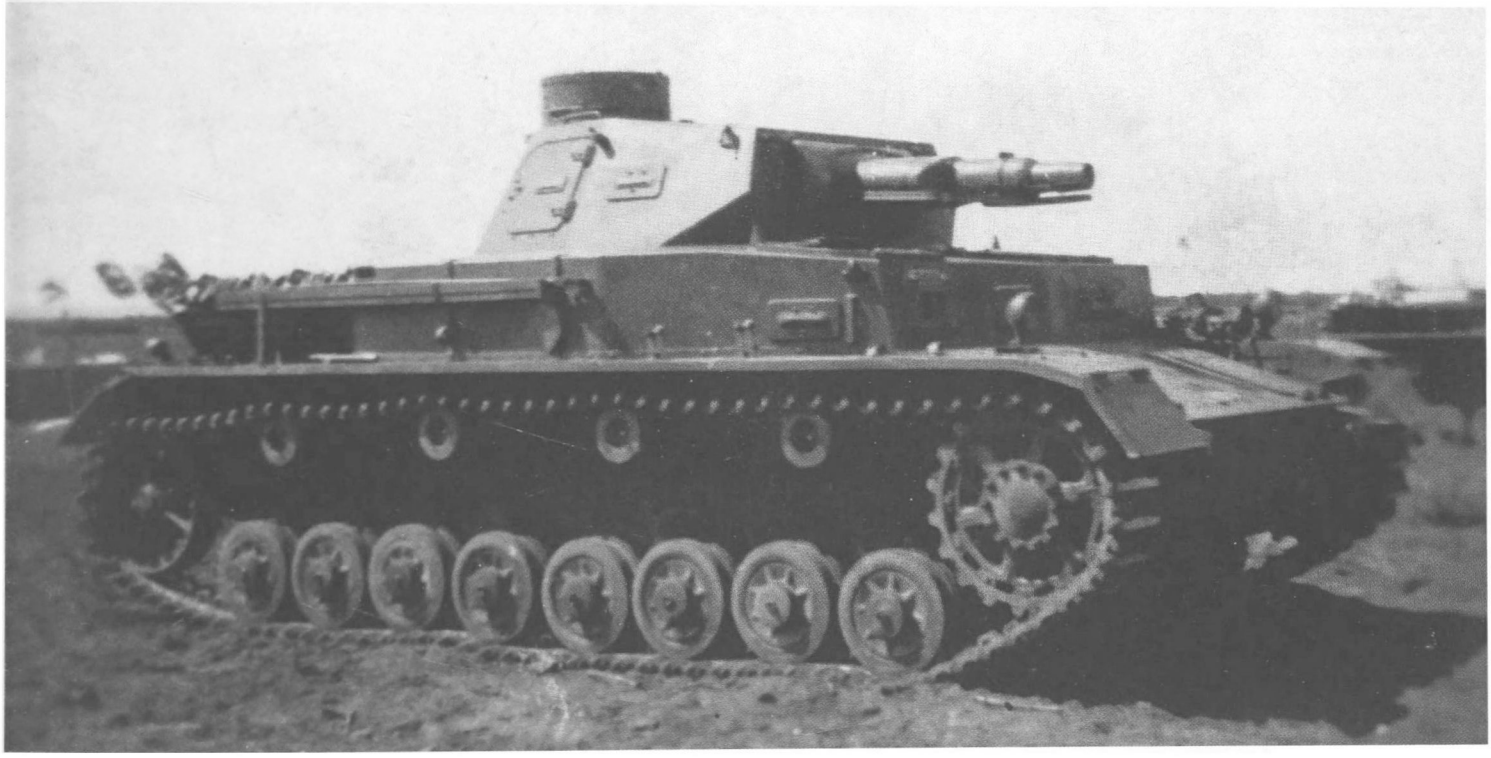
The Pz IV *Ausführung* A was very similar to the BWI to look at, with a hull superstructure that extended almost to the sides of its trackguards and a driver's front plate with a "bay window" appearance to give him more room than the hull machine gunner/radio operator who sat beside him. The hull machine gun was in a simple ball mount and the vision port flaps were also very simple. The turret mounted a short 7.5 cm gun with coaxial machine gun in an 'internal' mantlet – the moving armour that protected the gun mount being behind an outer cover. The commander's cupola was a simple drum shape and turret vision ports were, again, very simple. Maximum armour was only 14.5 mm on the best-protected areas: the near-vertical hull front plates, the turret, and the cupola; it was intended only to be proof against armour-piercing rifle or machine gun bullets.

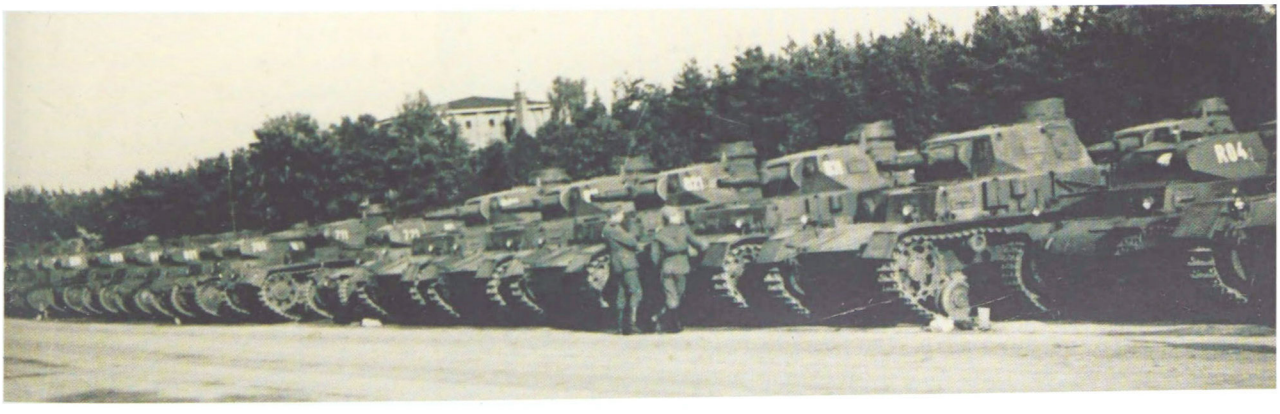
The *Ausführung* (*Ausf* for short) B, produced during 1938, had a number of detail changes. Its armour now went up to 30 mm maximum thickness in the vulnerable frontal areas, to protect it against 2 cm



The rear view of a Pz IV Ausf A shows how its superstructure sides come out beyond the V of the engine deck louvres. In all the later versions the superstructure was slightly narrower, so its sides were in line with the V. (Prigent Collection)

Below: This Pz IV Ausf A is very unusual. It has the expected simple drum-shaped commander's cupola and the engine air vent with four louvres of this version, but has been fitted with the hull machine gun mount of an Ausf D instead of the simple ball mount normally found on Ausf A. (Prigent Collection)





Here is a complete Company line-up of Pz IVs, IIIs and IIs seen in 1939. The closest Pz IV, without a tactical number, is an Ausf A showing its normal, simple, hull machine gun ball mount. Next to it are two Ausf Bs with two Ausf Cs beyond them. Their grey and brown colour scheme is clearly seen. (Prigent Collection)

A Pz IV Ausf C most unusually showing its tactical number of 412 with a dot on the hull front as well as on its turret sides. The photograph is believed to have been taken at Eisenach exercise ground in 1939. (Prigent Collection)

This Pz IV Ausf C with tactical number 432 was photographed at Grafenwohr in 1939. The armoured sleeve of its coaxial machine gun is clearly seen. (Prigent Collection)

This Pz IV Ausf B is unusual in carrying a Wehrmacht number plate. It also shows the different shape of its external gun mantlet to that of the Ausf C, visible by comparing these two photographs. Not visible is the other main difference between the Ausfs: the C had an armour sleeve around its coaxial machinegun while the B's machinegun had no armour. (Prigent Collection)

armour-piecing shot, the superstructure width was reduced, the bay-window driver's plate was straightened to give more space to the radio operator (who no longer had a machine gun but instead a vision port and a separate port to fire through with a pistol), the cupola was replaced with an improved type featuring armoured sliding shutters over its vision ports, and all other vision ports were upgraded with better armour. Both *Ausf A* and *Ausf B* were only built in small numbers and were retired to training use after the fall of France.

Ausf C followed in 1938 and 1939 and was built in much larger numbers, with 134 gun tanks and 6 chassis for bridgelayers. It was very similar to *Ausf B*, the visible changes being a minor reshaping of the top edge of the outer mantlet armour and the addition of an armoured guard for the coaxial machine gun's barrel. Like the earlier versions it was mainly used for training after the fall of France.

The last version of Pz IV designed without the test of battle was *Ausf D*, which reintroduced the radio operator's ball-mounted machine gun and the 'bay window' driver's front plate. A total of 232 were built, after the Polish campaign had ended but too late to incorporate the thicker armour that battle experience had shown was needed. It served in France, Russia and North Africa. Later Pz IVs were successively improved with thicker armour and more powerful guns, but description of them will be dealt with in later books of this series.

THE *PANZERKAMPFWAGEN* 35(T)

The takeover of Czechoslovakia yielded a fine haul of Czech tanks, including the LT35 (which went through several title changes in German service but is best known as the Pz 35(t)). It carried a 3.7 cm gun with a coaxial machine gun and another machine gun for the radio operator, and was as fast as the PzIII as well as better-armoured than that tank. Two hundred and two were taken over, with most used to equip *1. Leichte Division* (later expanded to form *6. Panzer Division*. Like the Czechs, the Germans did not regard the Pz 35(t) as entirely satisfactory so no more were built and it slowly disappeared from service during the Russian campaign.

THE *PANZERKAMPFWAGEN* 38(T)

The Czech Pz 38(t), on the other hand, was very popular. The Germans were able to seize the entire first production batch of 150 while most were still being built, since it had been ordered only shortly before the invasion, and it quickly gained a reputation for reliability. With four large wheels each side on leaf springs it had a good suspension, and with the same armament as the Pz 35(t), and higher speed and at least equivalent armour to the Pz III in the first batch, it was a godsend for the *Panzerwaffe* that was so chronically short of medium tanks. Extra batches were ordered, slightly changed from the Czech specification, so the first 150 were later designated *Ausf A*. The *Ausfs B* and subsequent Pz 38(t)s were only produced after the Polish campaign but the *Ausf As* that had already been completed were used there by *3. Leichte Division*. In fact the Pz 38(t) chassis was so good that it was later used for self-propelled guns, including the famous '*Hetzer*', and personnel carriers based on it were used by Sweden for many years after the war.

ARMOURED CARS

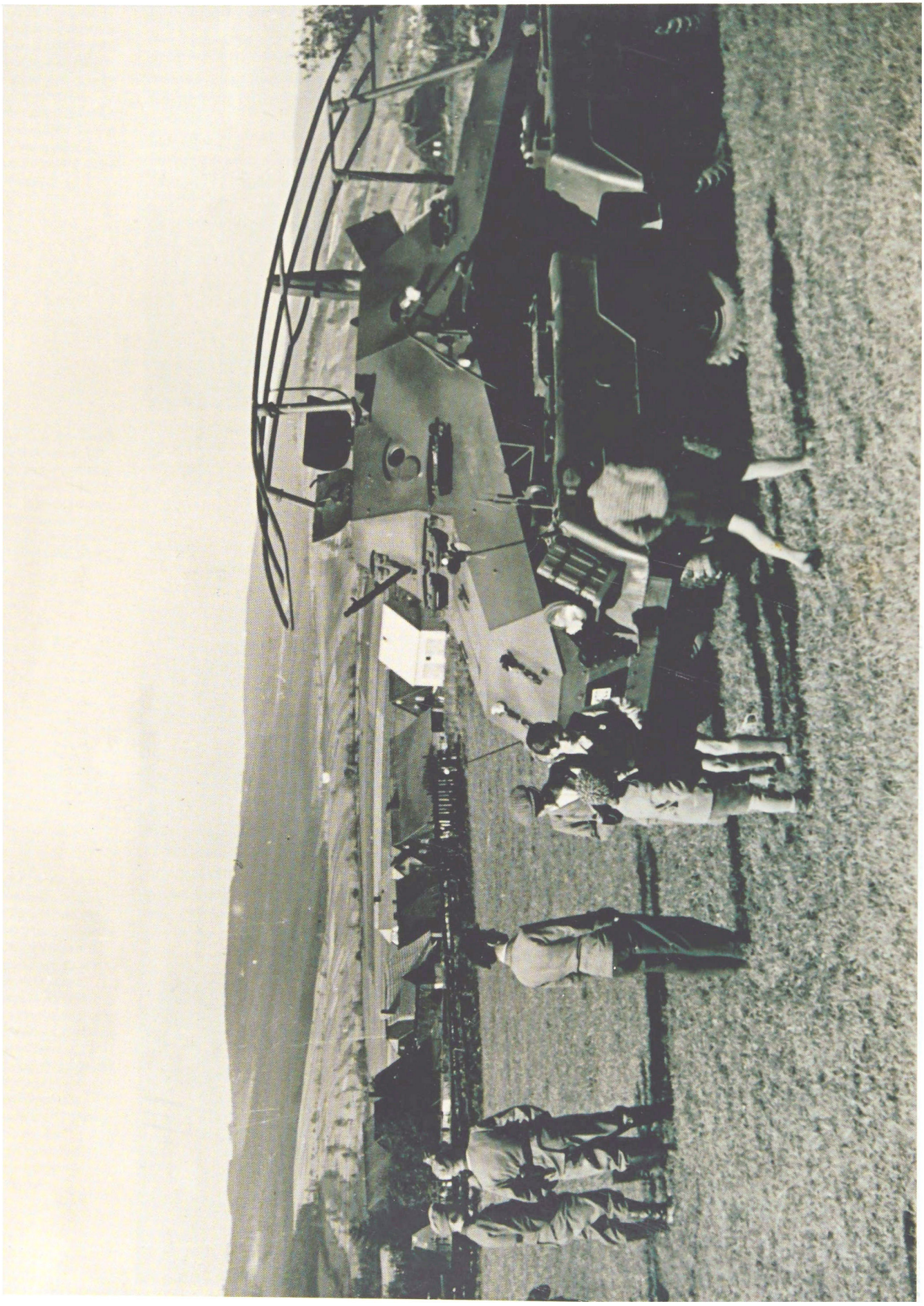
The *Reichswehr* was permitted to have a few armoured cars. Designated Kfz 3, they were produced before 1927 by adding a 5 1/2 ton armoured body to already-heavy converted artillery tractors. Needless to say they were essentially roadbound and retired when better equipment became available, but at least one was pressed into service during the siege of Berlin in 1945.

Next to appear were the Kfz 13 machine gun carrier and Kfz 14 radio car, armoured to protect against armour-piercing 7.92 mm bullets from the front but only against ordinary rifle fire from sides or rear. Nearly 150 were built on strengthened Adler and Daimler-Benz car chassis between 1933 and 1935. These were not roadbound but were only rear-wheel drive so had limited cross-country ability, and thus when better cars became available, they were transferred from the *Panzer Division* reconnaissance units to serve beside horsed cavalry. They saw active service in the Polish and French campaigns.

In 1933 Germany introduced six-wheeled armoured cars, the SdKfz 231, 232 and 263 built on cross-country truck chassis from three different manufacturers. Like the SdKfz 13 and 14, they only had limited cross-country ability, with only the two rear axles being driven, but they did include a rear driver's position to allow a quicker getaway from trouble than simply reversing would permit. 231 and 232 versions had turrets mounting a 2 cm gun with a coaxial machine gun, but the 232 also carried a radio and frame aerial while the 263 used a fixed version of the same turret carrying both a frame aerial and a telescopic aerial mast for its more powerful radio sets, and had only a ball-mounted machine gun for self-defence.

Then came the SdKfz 221, 222 and 223, all built with similar bodies on a rear-engined chassis designed for military use and with four-wheel drive. The 221 had a small turret with a single 7.92 machine gun, but no radio, and was built from 1935 to 1940. The 222 was more potent, with a larger turret mounting a 2 cm cannon and coaxial machine gun but still no radio, and was built from 1937 to 1944. The 223, the radio car of the series, actually appeared in 1936, before the 222. It carried a frame aerial for the radio and a small turret armed like the 221. It remained in production until 1944.

In 1937 the eight-wheeled armoured cars appeared. With eight-wheel drive and eight-wheel steering they had a better cross-country performance than the earlier designs, and they also had the rear driver's



An SdKFz 263 radio car being shown to children on one of the Wehrmacht's open days. It already carries the post-1935 grey and brown colour scheme. (Prigent Collection)

An SdKfz 231 6 rad is followed by Kfz 13s. The photograph was taken before 1937 and even though it bears a WH (for Wehrmacht) registration number, its three-colour camouflage remains from Reichsheer days. Like the Kfz 13s behind, it bears not only the early form of tactical symbol for an armoured car unit, apparently in yellow, but also the rhomboid sign for panzers. Unfortunately the name on its side is illegible. (Prigent Collection)

This SdKfz 231 6 rad was photographed in 1935 during the Nuremberg manoeuvres. (Prigent Collection)

A Kfz 13 and Kfz 14 of the Reichswehr seen on exercises in the mid-1930s. (Prigent Collection)

position to allow driving in reverse at full speed of 90 kph. They were rear-engined, and armed and equipped like their six-wheeled predecessors. Having been intended to fill the same roles of armoured car, armoured car with radio, and long-range radio car respectively, they were given the same designations of SdKfz 231, 232 and 263; to avoid the obvious confusion, 8 rad (8 wheel) was added to their SdKfz numbers and the six-wheeled versions had 6 rad added. The 263 (8 rad) had a fixed superstructure instead of a turret.

Like their contemporary tanks, but more understandably since they were expected to retire when opposition was met, none of the armoured cars were armoured to resist more than rifle-calibre armour-piercing bullets.

Halftracks

Four and six-wheeled trucks were unable to keep up with the Panzers across anything worse than smooth open country, so design work began in 1933 on a series of 'halftrack' vehicles to be used as gun tractors and recovery vehicles. The SdKfz 10 was a 1-tonne vehicle for towing light artillery – the 3.7 cm anti-tank gun and the several light Flak guns; it appeared in 1937. The SdKfz 11 was a 3-tonne tractor, introduced in 1934 for similar purposes. SdKfz 6 had a 5-tonne capacity and was produced from 1935, while SdKfz 7 could haul 8 tonnes and was produced from 1938 as a tractor for heavier guns such as the 8.8 cm anti-aircraft gun. More powerful still were the SdKfz 8 12-tonne prime mover used for towing heavy artillery, and the SdKfz 9 with an 18-tonne capacity for recovery jobs and for towing tank-transporter trailers.

As well as these towing vehicles there were also armoured derivatives of several of them. The SdKfz 251 was designed as an armoured troop transport capable of accompanying the Panzers anywhere, using a modified version of the SdKfz 11 chassis. With its production beginning only in mid-1939, it is not surprising that less than 70 had been built by the start of the campaign in Poland and only a few were in action, as command vehicles, with most still being in use for troop trials and training. An unarmoured version was also being produced, with a mild steel body since armour production lagged behind chassis availability, and about the same number of these were also available. All of these were *Ausf* A vehicles, with two vision ports each side of the troop compartment behind the ones provided for the driver and commander. The armoured and unarmoured versions can be distinguished by the use of cast, bulged armour for the port covers of the armoured hull, the unarmoured hulls having flat port covers. The SdKfz 8 was also built in an armoured version mounting a special version of the 8.8 cm anti-aircraft gun for use as a bunker-buster, which was used in the Polish campaign. Other armoured halfracks came too late for that fighting and will be dealt with in the appropriate books of this series.

Camouflage colours

During World War One the Germans used disruptive camouflage schemes in sand, green and brown – which were to return in 1943. It is not clear what camouflage colours were used in the 1920s, but the first series of Pz I A was ordered to be delivered in *feldgrau* (field grey), a grey-green paint used at the time for civilian vehicles used by the army so suitable for the pretended role of the 'tractors'.

By 1935 a new three-colour scheme had been introduced using earth yellow, brown and green, all three much more subdued in tone than the World War One colours (these colours can be seen in photographs of *Reichswehr* armoured cars, so must have been in use for some time before the *Reichswehr* was replaced by the *Wehrmacht* in 1935). The three colours were applied in irregular patches, every vehicle different to a greater or lesser degree, and could have a narrow black border separating them though this seems to have been very rare. The patches could have 'soft' edges, feathered together by a paint sprayer, or be hard-edged as if applied with a brush; both styles were used.

Then, in 1937, a new scheme was introduced using the famous 'Panzer grey' with a different brown applied in large soft-edged patches to cover 1/3 of the vehicle. These two colours were both very dark and hard to tell apart in photographs, even when clean and especially under a coat of dust, so it is not surprising that for many years it was thought that German tanks were painted overall grey at the beginning of the war. The overall grey scheme did not, in fact, emerge until July 1940, after the fall of France.

National insignia

German tanks carried no national markings until July 1939, when white crosses were ordered to be painted on both sides, front and rear to distinguish them from enemy tanks. They were also to have white rectangles painted on their engine decks for air recognition. The white crosses stood out very well on a battlefield, so much so that the crews believed they were being used as aiming marks by the Poles, and in many cases they were subdued with a coat of mud or had their centres painted out; opinions differ over the colours used for this, but some photographs show grey centres and others show what appears to be yellow. After the Polish campaign this high visibility was officially acknowledged by an order in October 1939 to replace the white crosses with new black ones outlined in white. Several forms of cross could be seen, with wide or narrow arms of varying lengths, and some units seem to have settled for just applying the white outlines of the arms – leaving the background grey between them.

Unit markings and tactical numbers

The first unit markings were applied for 1 PzDiv's initial exercise in 1935, when playing card symbols were used – hearts, spades and clubs are seen in photographs so diamonds may well have been used as well. For the 1937 exercises, this system was replaced by placards 420 by 240 mm – officially light grey but white seems to have been used as well – carrying various symbols to identify units and sub-units. Even these were found too limited, so a new system was introduced using white numbers on black rhomboidal placards at sides and rear. The numbering was straightforward: the first digit identified the company, the second digit the platoon, and the third the tank within the platoon. The placards were supplemented by some units during the Polish campaign by the same numbers painted large on the turret sides, and eventually dropped after the campaign so that just the turret numbers remained, and were often on the turret or hull rear as well. Sometimes the first number was replaced by a letter in headquarters units – R for *Regiment* and N for *Nachrichtung* (signals) being common, and a *caduceus* (the 'snake round a staff' symbol) for medical officers. Roman numerals I and II were also used, identifying the tanks of the first and second battalions' headquarters within a regiment.

This still left the question of how to identify the division. Symbols were used on hull sides, or fronts and rears, usually painted yellow in the early days though other colours came into use later in the war. An official list was issued after the Polish campaign, but at least some symbols were already in use during the campaign such as *4. PzDiv's* 'Mercedes star' – an inverted Y within a circle, drawn with doubled, rounded lines and a small circle at its centre. 1 PzDiv used an oakleaf as its symbol, though its official emblem after October 1938 was a single dot, but it is not certain that the oak leaf was used during the Polish campaign.

Other markings

There were official symbols for the various types of unit, usually applied only to softskins such as trucks and cars but sometimes seen on armoured cars too and self-propelled guns when these came into service. It was very unusual to see the Panzer symbol, a solid white or white-outlined rhomboid, on a tank because these were always assumed to belong to a Panzer unit.

Tanks were identified by *Fahrgestellnummern* (chassis numbers) which were stencilled on the glacis or the driver's front plate. They are usually invisible in photographs due to dust, but sometimes the number can be seen on a jack or other equipment.

Wheeled *Wehrmacht* vehicles carried number plates, showing a letter prefix and black numbers on a white background. For the *Heer* (Army) the prefix was WH, with WL for the *Luftwaffe* and WM for *Wehrmacht Marine* (the Navy). These number plates appeared on armoured cars and also on halftracks. On rare occasions number plates also appeared on tanks, mainly when they were used for driver training but also when they were undergoing tests before acceptance by the *Wehrmacht*. Those plates had different letter prefixes allocated according to the place of registration.

The creation of the Panzer Divisions that fought in Poland

1. PzDiv was formed in Weimar in August 1935 from parts of the old *3. Kavallerie* (Cavalry) *Division*. It had *Panzer Brigade 1* made up of *Panzer Regiments 1* and *2*, both formed in October 1935 with two battalions each.

2. PzDiv was formed in Würzburg in October 1935 and its *PzBde 2* had *PzRegts 3* and *4*. *PzRegt 3* had been formed in Dresden in May 1935 as motorised cavalry but converted to an armoured regiment in October that year, and *PzRegt 4* was formed in October 1935 at Ohrdruf. After the Anschluss with Austria *2. PzDiv* was stationed in Vienna until the Polish campaign.

3. PzDiv was formed in Wunsdorf, also in October 1935, and its *PzBde 3* had *PzRegts 5*, formed in October 1935, and *6* formed at Zossen also in October 1935.

4. PzDiv, like *2. PzDiv*, was formed at Würzburg but not until October 1938. It had *4. PzBde* with *PzRegts 35* and *36*. *5. PzDiv* had *5 PzBde* with *PzRegts 15* and *31* and was formed at Oppern in October 1938 although *PzRegts 35* and *6* were not formed until November 1938, at Bamberg and Schwerin respectively.

I. LeichteDiv was the strongest of the light divisions, with *PzRegt 11*, formed at Paderborn in October 1937, and *65 PzAbt*, formed at Sennelager in October 1937. It fought thus in Poland, and was transformed into *6. PzDiv* after the campaign.

2. LeichteDiv had *PzRegt 66*, formed at Eisenach in November 1938, and became *7. PzDiv* after fighting in Poland.

3. LeichteDiv had *67. PzAbt*, formed at Gross-Glienecke in November 1938, formed at St Poelten in July 1938, and became *8. PzDiv* after the Polish campaign. *4. LeichteDiv* had *33. PzAbt* and became *9. PzDiv*.

PzDiv Kempf was formed in East Prussia as an ad hoc unit as late as August 1939, with both Army and SS units including *PzRegt* 7 which had been formed at Ohrdruf in October 1936. The division was disbanded after fighting in Poland.

As is clear, the effort to create Panzer units had led to a certain amount of confusion with, in some cases, regiments being formed after the divisions that were to command them.

Austria and Czechoslovakia – 1938

Austria had few armoured vehicles for the Wehrmacht to take over, but one series that did create interest was the wheel-and-track vehicles designed by Saurer. They could run on roads using wheels and also retract them to run on tracks across country. These are wheel-and-track ammunition carriers parading in Vienna in 1937. (Prigent Collection)

by Carlos Caballero Jurado

Austria – the *AnschlussPanzerwaffe*

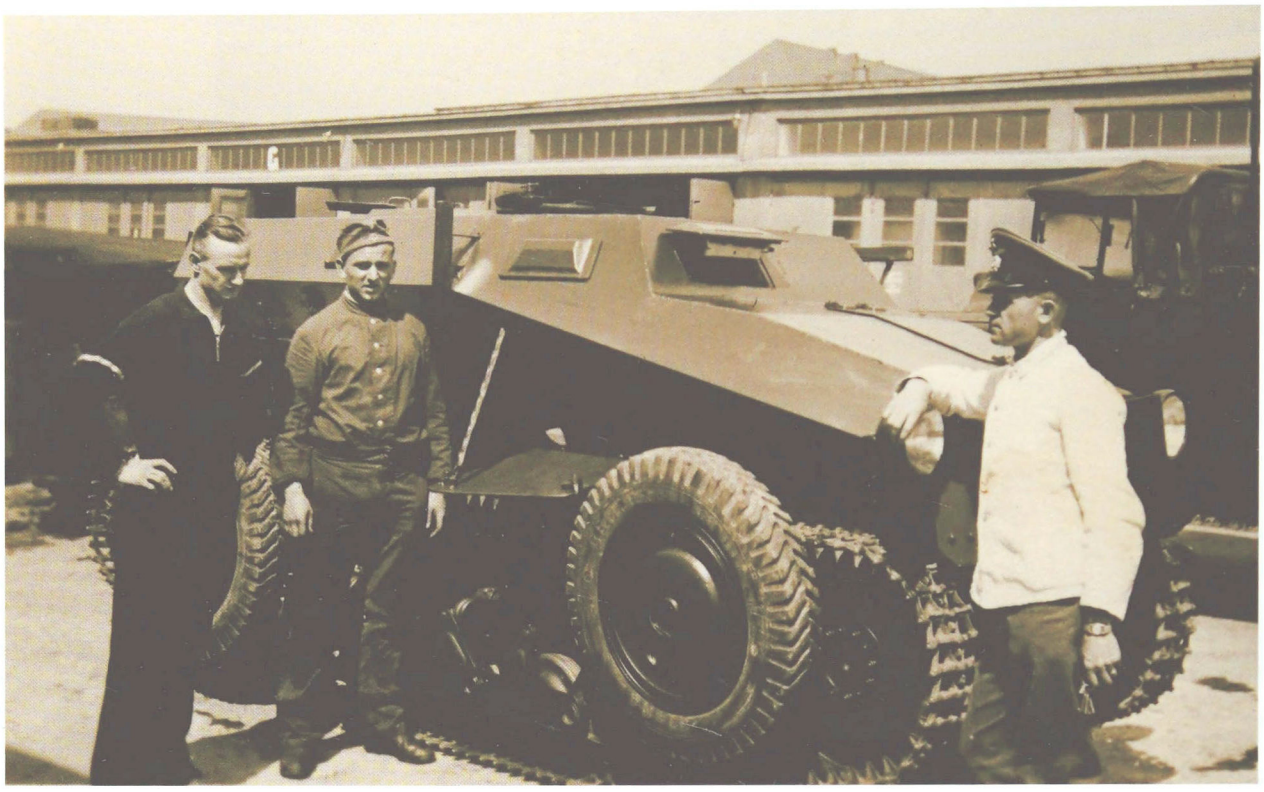
HITLER always wanted Austria to be part of the Reich and expected to achieve this through political means, but the conservative dictatorship in control of Austria since 1934 opposed unification with Nazi Germany. However, Nazism did not cease to spread in Austria. In 1937 orders were issued to prepare a plan for military intervention in Austria, '*Fall Otto*', in the event that any attempt to reinstate the Habsburg dynasty was made in that country. In February 1938 the chancellors of Germany and Austria – Hitler and Schussnigg – met but did not manage to overcome the confrontation. And on 9 March, Schussnigg called for a plebiscite that would be held on the 13th to ratify Austrian independence. The country seemed to be on the verge of civil war between supporters and opponents of unification with Germany. On the 10th, Hitler ordered the immediate invasion of Austria. Only 48 hours later, on the 12th, *General* Beck (Army Chief of Staff), who opposed the idea of the invasion, said that a large number of troops were necessary to put it into practice. But as no plan for '*Fall Otto*' had been devised one had to be improvised in a hurry, and the task was entrusted to Erich von Manstein, another genius of armoured warfare. Although a whole Army (the Eighth, under von Bock's orders) was mobilized for the operation, von Manstein saw that speed was the key factor (to abort any Austrian resistance or to prevent a reaction from the Czechs), and the main role was allotted to 2. *Panzer Division*, which would carry out a meteoric advance on Vienna.

But the base of 2. *Panzer Division* was 400 kilometres away from the Austro-German border and, as the situation had not been foreseen, it was not fully operational. The Panzer crews were not properly trained. Part of the Staff was on an exercise, too far from the base. The Division did not have fuel transport columns or mobile workshops. No suitable maps were available (tourist guides had to be bought). Nevertheless at midnight on the 11th, 2. *Panzer Division* was already on the Austrian border. Along with the units that were attached to it, it was put under the orders of the *Panzerkorps* to be commanded by *Generalleutnant* Guderian.

At the spearhead was the reconnaissance group of the Division (*Aufklärungs Abteilung* 5), reinforced by *AA* 7, and the Motorcycle Fusiliers Battalion of the Division (*Kradschützen Btl.* 2). Behind them were the two Panzer Regiments, 3 and 4. Their strength was incomplete, for they had only 184 Panzer Is and 45 Panzer IIs. As the Division had a single Motorized Infantry Regiment (*Schützen Rgt.* 2), the motorized SS Regiment '*Leibstandarte Adolf Hitler*' was attached to it (although Berlin buses and removal lorries, etc, had to be requisitioned to achieve full motorization). Anti-aircraft protection was ensured by two light groups of the '*General Göring*' Regiment of the *Luftwaffe*.

During the 11th the Austrian Government made some attempts at organising resistance, but in the end chancellor Schussnigg gave his resignation to President Miklas and a new government was formed which was in favour of the unification with Germany. The Austrian Army had a single armoured force, the Light Division, with twelve Steyr ADGZ armoured cars and 72 Fiat Ansaldo CV-33 light tanks.

Early on the 12th, Guderian's *Panzerkorps* initiated its penetration into Austria. Because of the supply problems many units had to refuel – at Austrian petrol stations! But the advance was too fast, and Vienna



Austria's Saurer armoured observation vehicles proved of interest to the Germans, and were taken into Wehrmacht service for use by artillery forward observers. Their complicated mechanisms did not stand up well to field service, so few were built. (Prigent Collection)

would have been reached shortly but for the fact that it had to be slowed down to organise security in Linz, where Adolf Hitler – who had lived there in his boyhood – entered on the 12th. Even so, at midnight the vanguards of 2. *Panzer Division* entered Vienna where crowds, surprised by their swift appearance, hailed them.

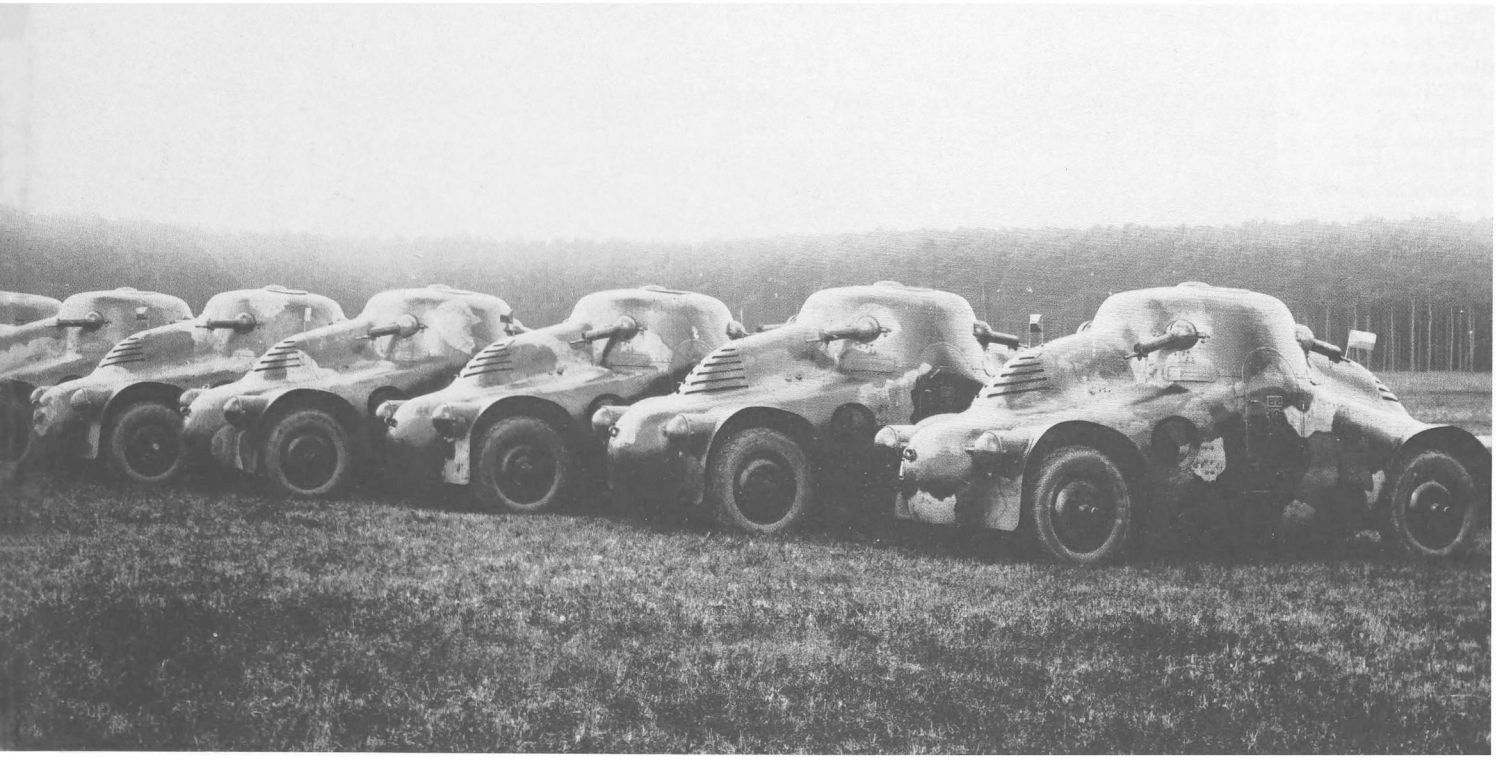
From its base to Vienna 2. *Panzer Division* had advanced over 700 km in 48 hours. For such fragile vehicles as the Panzer Is this meant serious wear, as a result of which at least 30 per cent of the tanks were out of use due to breakdowns before reaching Vienna. The most conservative German generals made good use of the occasion to criticize the *Panzerwaffe*, as it seemed that an armoured division would write itself off with breakdowns in just three or four days of operations. The old infantry, on foot and on horse, looked much more reliable. However, had the *Wehrmacht* trusted these old means it would have taken them at least four or five days to reach Vienna, thus opening a time interval in which the Austrian or international political situation could have taken an undesirable turn for Germany. It was the *Panzerwaffe* generals who were most conscious that the Panzer Is were no good as war machines. But even with such poor means a real *Blitzkrieg* had been achieved. However, in the case of Austria, the enthusiastic welcome that the German troops got made this campaign known as the '*Blumenkrieg*' ('Flower War').

The seizure of Czechoslovakia

Unlike Austria, in the case of Czechoslovakia, Hitler had always bet on a military solution to the strategic problem that this country posed to the Reich. It formed a deep wedge well into German territory. The fact that, when Czechoslovakia was created in 1919, over three million Germans had been included in the country against their will also raised constant tension. When the Germans living in the mountain region around Bohemia, called the Sudetenland, saw the *Anschluss* of Germany and Austria, they also started large-scale agitation to join the Reich. The Czech Government responded with repressive measures that gave Hitler the perfect excuse to act.

Since mid-1937 the German High Command had been working on '*Fall Grün*': a two-front war game, where the German main initial effort was to be made against Czechoslovakia. By February 1938 there was already a very elaborate plan: the bulk of the German troops would attack from Silesia, southwards through Moravia to split Czechoslovakia in two. Virtually all the Panzer forces available would take part in this attack, which would break through the very powerful Czech fortifications in northern Moravia. The unexpected occupation of Austria in March opened up a completely new perspective: now it was possible to carry out a pincer attack, from both Silesia and Austria. As the Czech fortifications in southern Moravia were much weaker a plan was immediately devised to exploit this possibility, by placing part of the Panzers in Austria.

But a fundamental change came on Hitler's orders, as he did not want to launch the Panzers against the fortified lines on support operations for the infantry but on an attack that would exploit their speed, starting from Bavaria and into the heart of Bohemia, to Prague. The High Command opposed it as much as



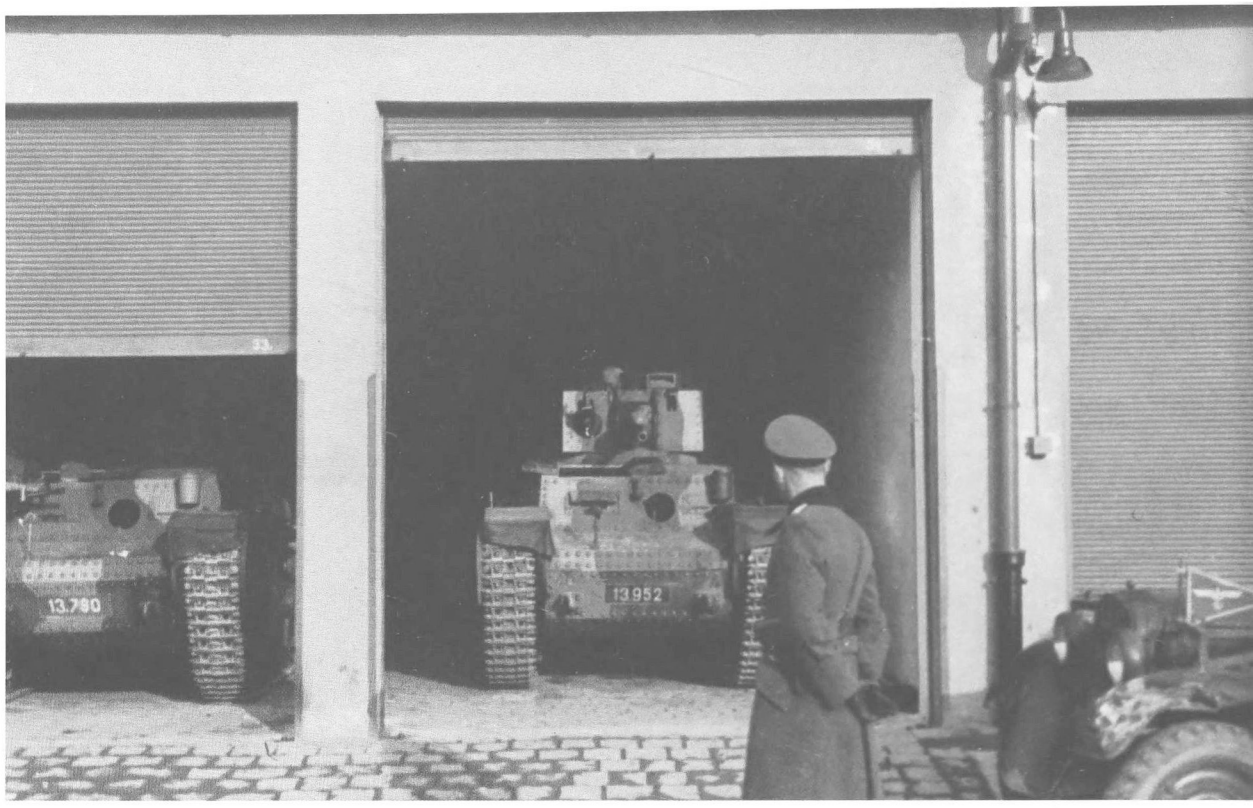
Czechoslovakia had a good store of armoured vehicles, among them these PA-II armoured cars from the 1920s. Seen here in their 1930 Czech camouflage, they were used by Wehrmacht police units in rear areas despite their lack of rotating turrets. (Prigent Collection)

These Pz II Ausf b were photographed in the Sudetenland in October 1938. (Prigent Collection)

it could, but the deployment finally adopted reflected Hitler's point of view. On the other hand, all efforts had been made to increase the power of the Panzer and motorized troops after the *Anschluss*.

The plan that was eventually approved, an attack from Silesia southwards, would count on a *Panzer Division* (the Third) and an independent *Panzer Regiment* (the 15th). Among the troops advancing northwards from Austria to meet them were 2. *Panzer Division*, 4. *Leichte Division* (which had just been established) and a motorized infantry division. But the attack that was seen as decisive was the advance from Bavaria and on to the East, to Prague, which would be carried out *by* 3. *Panzer Division*, 1. *Leichte Division* and three motorised divisions. The early Panzer IIIs and IVs, which were joining the units in very small numbers would take part in the operation.

The danger of war was now most real. The Czech Army had excellent armament, with better tanks than the Panzer Is and IIs (although in smaller numbers). But the ethnic composition of the country (with ethnic minorities of Germans, Hungarians, Poles and Ukrainians, and the Slovaks confronting the Czechs) weakened in practice the strength of the state and of its army. In the end a diplomatic solution was reached



Two LTvz 35 are seen, still in their Czech Army camouflage, being inspected by a German Army commission sent in May 1939 after the seizure of the rump of Czechoslovakia to assess what Czech equipment might be useful. The officer is belived to be Oberstleutnant (Lieutenant Colonel) Olbrich, the head of the commission. The serial numbers show that these two tanks are from the batch built by CKD. (Prigent Collection)

This is Skoda's prototype S-III-6 medium tank under test by the German commission in May 1939. It was not put into production for the Wehrmacht. (Prigent Collection)

with the Munich Agreements (29 September 1938): Czechoslovakia abandoned the Sudetenland, which was occupied by the Germans without a shot on 1 October. It was a new '*Blumenkrieg*'.

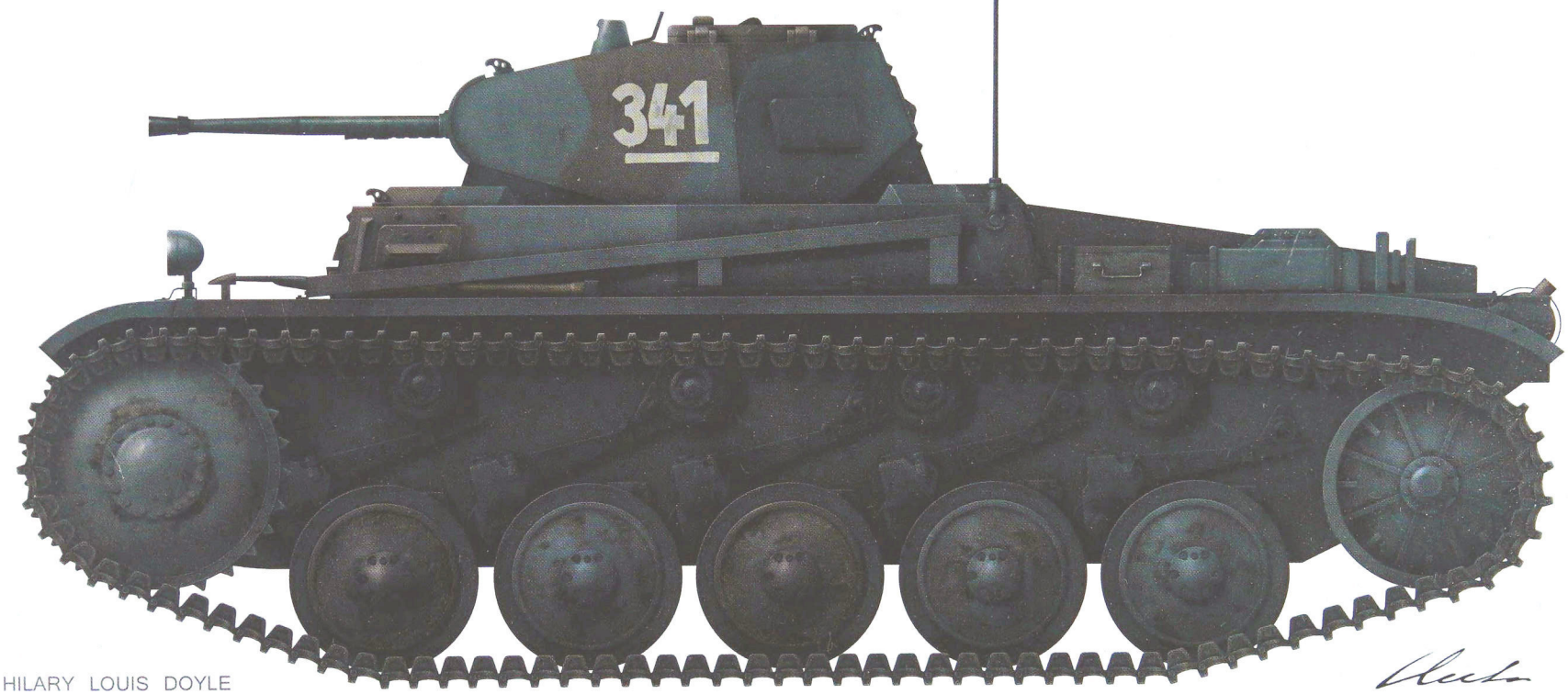
From then on Czechoslovakia entered an acute process of dissolution, which was encouraged as much as possible by the Germans with their support to the Slovak independence fighters. The *Wehrmacht* drew up a new plan, '*Unternehmen Südost*', to occupy Bohemia-Moravia as soon as there was a chance. This came when the Czech Government tried to crush the Slovak separatists, who asked Germany for help. While the Czech president was in Berlin, where he was put under pressure during the night of 14 March until he agreed to make Bohemia-Moravia into a German protectorate, nine German infantry divisions, and nine '*Schnelle Truppen*' (Fast Troops) divisions entered the country. Moravia was occupied from the North by 5. *Panzer Division* and 2nd Motorised Division and, from the South by 2. *Panzer Division* and 4. *Leichte Division*. Bohemia was occupied with a concentric advance by 3. and 4. *Panzerdivisions*, 2. and 3. *Leichte Divisions* and 29th Motorized Division. On 15 March, when the Czechs started an uprising, the 3. *Panzer Division* tanks were already in the streets of Prague. This time there was no popular welcome. But the war booty captured from the Czechs was so great that it allowed Germany to establish new Panzer Divisions, armed with Czech tanks.

A Pz II A, B or C seen in early 1938 in an unidentified town in Czechoslovakia after the seizure of the Sudetenland.

Its grey and brown camouflage can be seen clearly. The turret number 341 identifies it as the lead tank of the 4th platoon, 2nd company and the underlining probably signifies the 2nd battalion of its regiment. (Prigent Collection)

Panzerkampfwagen II A, B or C

Weight: 9.5 tonnes
Crew: 3
Engine: Maybach HL 62 TRM, 140 HP
Speed: 40 km/h
Armament: 1 x 2 cm KwK 30 & 1 x MG34 7.92 mm MG
Length: 4.81 m
Width: 2.28 m
Height: 2.02 m
Armour: 14.5 mm basic + 20mm appliqué when uparmoured



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The Spanish Civil War

The Panzer I Ausf. B of the 3ª Compañía of the Batallón de Carros de Combate arrive in Santander on 26 August 1937, in the vanguard of the 4ª División de Navarra that occupied the town. (via L. Molina)

by Lucas Molina Franco

Panzer Gruppe – destination Spain

ON 23 September 1936 *Oberstleutnant* Wilhelm Josef *Ritter* von Thoma, commanding the 2nd Battalion of *Panzer-Regiment* 4 based at Scheinfurt, was sent urgently to Spain. His mission, as outlined by the *Heer* High Command, was to take charge of an armoured training group that was to sail for Spain within a week.

Three days earlier, on 20 September 1936, a meeting had been held at the Neuruppin base for the officers, NCOs and troops of the two battalions that made up *Panzer Regiment* 6, and commanders immediately asked for volunteers for a mission abroad of some importance though Spain was not mentioned. They warned their men that these were not just exercises or manoeuvres; real fire was expected and they could be taken prisoner, wounded or even be killed on the battlefield.

Almost every man stepped forward and volunteered for this secret mission outside their homeland; it represented a romantic adventure for some, and for most it would offer a good chance to put into practice the tactics learnt over long months. None of them knew their final destination or the significance of the mission but they knew for certain that it would not be an easy task.

With the personnel thus selected, the body of troops was organised and the standard tank types in the unit at the time were prepared: *Panzerkampfwagen* I *Ausf.* As, plus the different types of vehicles, trucks, motorcycles, and armament that were necessary to fulfil the mission.

The volunteers were taken to Döberitz, near Berlin, where they were given a bonus for urgent purchases and civilian clothes. In addition, during the period of absence from Germany, they became temporarily discharged from the *Wehrmacht* as it was necessary not to reveal the presence of German soldiers supporting one of the contenders in the Spanish conflict.

The German tank crews, now wearing civilian clothes and carrying false passports, made up a homogeneous group of young German travellers waiting to board a ship to spend their summer holidays under the sun of a country they still knew nothing about. The group was driven to Stettin, a port where they would board a ship in the belief their final destination was Danzig, a former German town that the *Reich* was claiming back from the Polish state.

On 28 September 1936 the members of the Panzer unit boarded the SS *Pasajes* and the SS *Girgenti*, which were also loaded with their impedimenta and all necessary *matériel* for their tasks at the destination.

The 267-man expedition was made up of the *Panzer Gruppe* Staff, two full tank companies, a transport company, a workshop, an armoury and an anti-tank gun training unit, with the following equipment: forty-one *Panzerkampfwagen* I *Ausf* A tanks, ten Büssing-NAG 80 trucks to tow tank carriers, six workshop trucks, eleven light cars, forty-five trucks (including fourteen Vomag tank carriers), nineteen low-loader *Sd. Ah.* 115 tank carriers and eighteen motorcycles, as well as twenty-four 37 mm *Pak* 35/36 anti-tank guns, assorted accessories and spares.

One of the Pz I Ausf A 'Breda' conversions moves along a Spainish road. Unfortunately its commander has decided to sit on the turret top so his legs cover the details of the new gun mantlet. (Prigent Collection)

Behind the 'Breda' conversion came an unmodified Pz I Ausf A. There appears to be a letter A on its glacis. (Prigent Collection)

The Breda was followed by three more Pz I Ausf A, one with a passenger in a very risky position. (Prigent Collection)

Hptm. Albert Schneider (right) was the commanding officer of the workshop company of Panzergruppe Thoma. In this image he is posing with fellow workshop officer Lt Paul Jaskula (left), who was killed in an air accident shortly afterwards. (Campesino via R. Arias)

The two crewmen of a Panzer I, in brand new uniforms and black berets, posing in front of their war machine, which has been perfectly camouflaged to commence operations with Spanish recruits. (Campesino, via R. Arias)

The German instructors were much appreciated by their Spanish trainees. Their teaching made the Spanish military aware of the superiority of the tactics employed against their Republican enemies, who had better equipment. (Wilhelmi, via L. Molina)

One of the huge Vomag tank transport lorries with an Sd.Ah 115 tank trailer and two Panzerkampfwagen I Ausf. A, all of them belonging to Panzergruppe Thoma. (Campesino, via R. Arias)

On 7 October 1936, the ships reached Spanish waters, and from then on they were escorted by the battleships *Admiral Scheer* and *Deutschland* and the torpedo boat *See Adler*. In the evening they moored in Seville, where the personnel and materiel were landed.

Although the men of the *Panzer Gruppe* were anxious to take to the field, they were not sent to the front immediately since their main mission was to train Spanish soldiers in the handling of the tanks and their combat use interpreting tactical lessons, learnt in their own country, of how modern armoured war should be carried out. Shortly after their arrival in Seville, they were sent to Cáceres by rail in several trips, between 8 and 10 October. A week later, on 18 October, Franco reviewed the troops at their base at the castle of Las Herguijuelas.

By then *Oberstleutnant* von Thoma had already assumed command of the unit, with *Major* Eberhardt von Ostman as his Chief-of-Staff. During November a further thirty-seven men joined them and, along with some of their comrades already in Spain and a further twenty-one tanks – in this case *Panzerkampfwagen* I *Ausf* Bs from *Panzer Regiment* 4 that had arrived in Seville on 25 November on the SS *Urania* – made up the 3rd Tank Company of the *Panzer Gruppe* commanded by *Hauptmann* Karl Ernst Bothe. In addition the *Panzer Gruppe* command post moved to Cubas de la Sagra, Madrid, where the Training School and the workshops were also established.

Accounting for losses and the men who returned to Germany, by late 1936 there were 299 German tank crewmen still serving in Spain. One year later there were only 124, and by late 1938 there were just 108 German tank crew.

From October 1936 to May 1939 von Thoma's men trained Spanish personnel in various operations such as tanks, anti-tank guns, flame-throwers, mine-throwers, gas protection, workshop duties, driving, and in work as armourers.

Panzer Gruppe Thoma, with its officers, NCOs and technical teams, also supported the following operational units on the different battlefronts:

- Four German tank companies, with 16 tanks each.
- Two 'Russian' tank companies, with 22 captured Soviet-built tanks (March 1938)
- Twenty anti-tank gun companies, with 10 guns each (March 1938)

Two Pz I Ausf As of II Batallón of the Agrupación de Carros de Combate de la Legión. The front tank is the 5th vehicle of the 2nd Section of the 1st Company, numbered 425 on its glacis and with a red-over-yellow tactical marking disc while behind it is the command tank of the 3rd Company with a red/white/red disc. Unfortunately, the number on the command tank's glacis is illegible. (Prigent Collection)

Panzerkampfwagen I

Weight: 5.4 tonnes
Crew: 2
Engine: Krupp M305 3.5 litre, 60 HP
Speed: 37.5 kp/h
Armament: 2 x MG13k 7.92 mm MGs
Length: 4.02 m
Width: 2.06 m
Height: 1.72 m
Armour: 5 to 15 mm

A Spanish Pz I Ausf A Command Tank

The red/yellow/red disc shows that this Pz I Ausf A is the command tank of the 2nd Company, II Batallón of the Agrupación de Carros de Combate de la Legión It carries the usual Spanish flag marking in the same colours and also the white badge of the Legión. The white marking on the glacis is the letter 'M' with splayed legs, standing for 'Mando' as short for Comando - command. (Prigent Collection)

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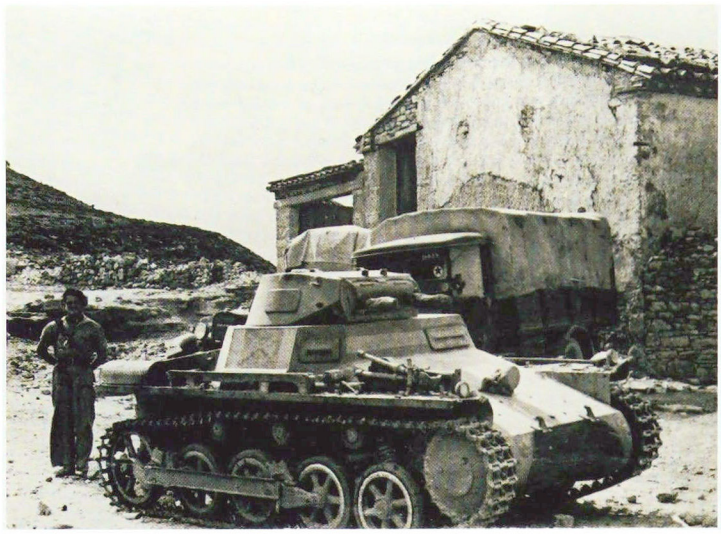
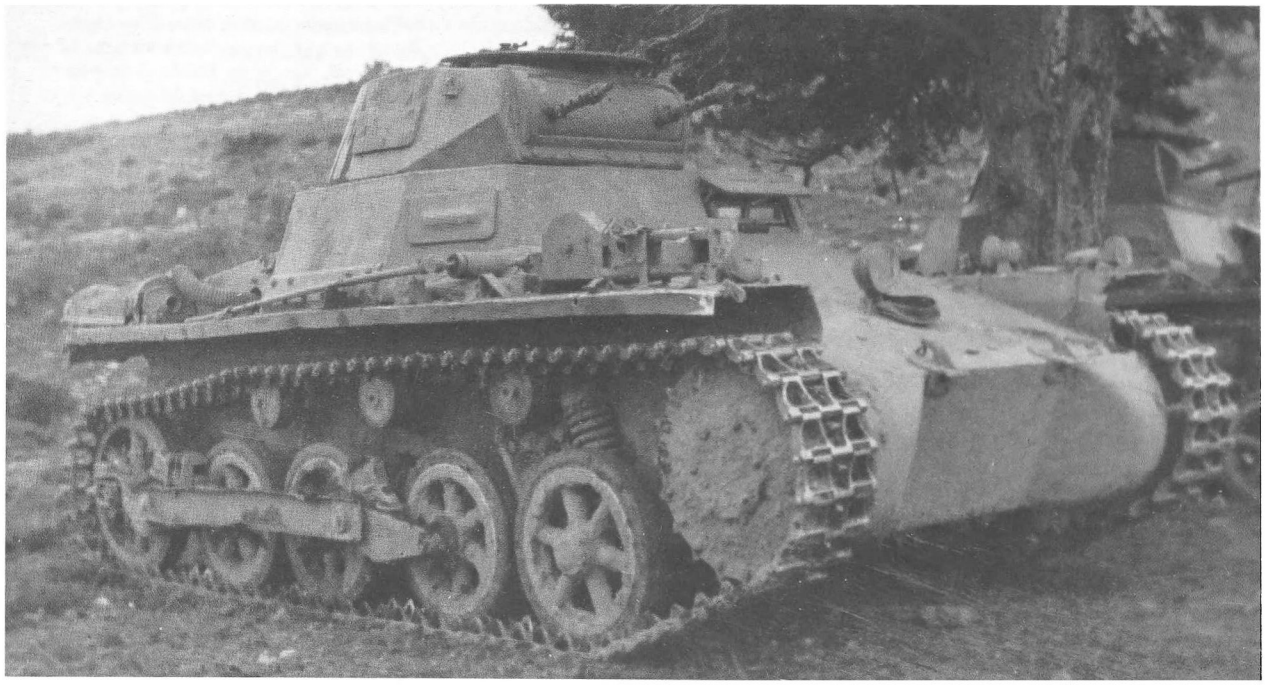
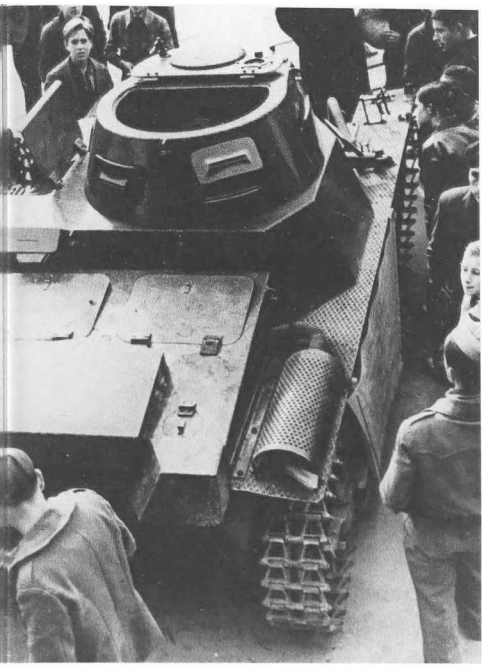


This Pz I Ausf A carries on its side the emblem of the Partido Tradicionalista (Traditionalist Party), the cross of Burgundy which was rarely seen on Nationalist tanks. It should be red on a white background, but the colours here appear to differ and may be red on a yellow background at the bottom changing to yellow on a red background at the top. (Prigent Collection)

ABOVE AND LEFT: For driver training the Germans supplied the Spanish with a Panzerkampfwagen I Ausf A 'ohne Aufbau'. As the image shows, as well as the instructor and trainee driver several more trainees could be accommodated sitting in the vehicle. (L. Molina collection)

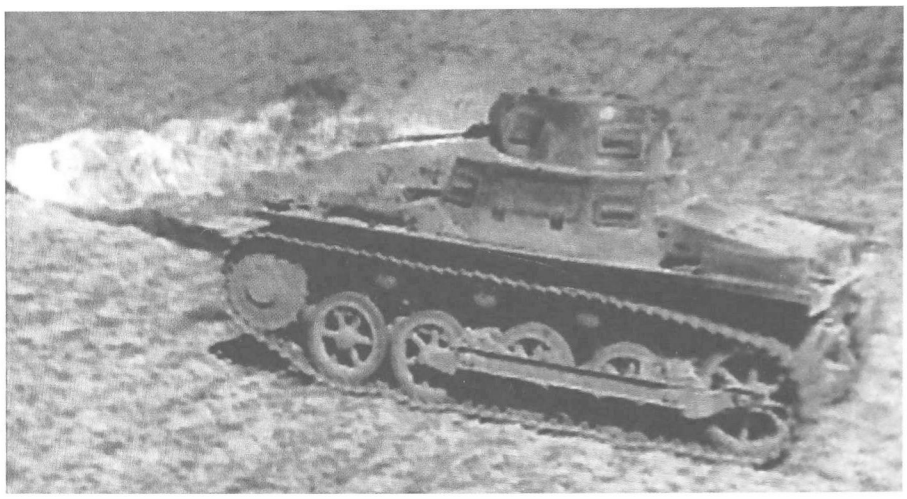


A very good image of a German Panzerkampfwagen I Ausf. A tank, the regular equipment of the German training unit in Spain and the tank units of the Ejército Nacional. (Negreira, via L. Molina)

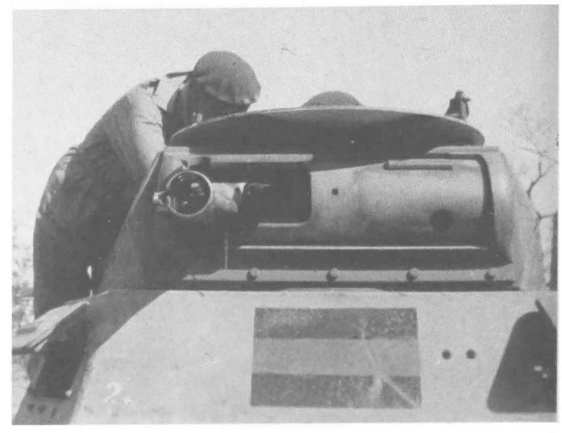


The Republican Army managed to capture a small number of German Panzer I tanks such as this one, which were shown off as war trophies. (B.N., via L. Molina)

ABOVE AND BELOW: A Panzerbefehlswagen I Ausf. B. The German Reich sent a total of four tanks of this model, three for command of the companies established in the Batallón de Carros de Combate,ß and the fourth for command of the battalion itself. The photographs show some of the tanks being tested on Spanish soil. (Marín-Mata, via L. Molina)



A Panzer I Ausf. A transformed into a Flammenpanzer in October 1936 by replacing one of the MGs with the hose of a light flame-thrower. On 27 October 1936 this tank left with the Batallón de Carros de Combate in the direction of Talavera de la Reina, in its advance on Madrid. (L. Molina collection)



A different mounting of a flame-thrower, on the turret of a Panzerkampfwagen I Ausf. A. The Spanish Civil War saw little use of this vicious weapon. (Aballe, via L. Molina)

THE *PANZER* I IN THE SPANISH CIVIL WAR

The purpose of the presence of *Panzer Gruppe* Thoma in Spain was none other than the training of Nationalist troops in the battlefield use of the *Panzerkampfwagen* I and the special vehicles of the transport unit and the workshops, as well as assorted *materiél* supplied by the '*negrillos*'[1].

A Spanish tank battalion had been established with personnel from *Regimiento de Infantería* 'Argel' *n° 37* in Cáceres on 1 October 1936. A week later the unit was organised under the command of retired infantry *comandante*[2] José Pujales, who had served in the Renault FT-17 equipped *Compañía de Carros Ligeros de Asalto* (Light Tank Company), and was thus highly experienced in the use and training of armoured equipment.

The Spaniards organised their unit taking as a model the German one that had just arrived in Cáceres: a Staff, two tank companies, a transport unit, workshops and an anti-tank company. On 1 December, when a new company of German tanks joined them, the Spanish *3ª Compañía* was also established at Cubas.

In order to avoid confusion with the various fusilier battalions that the *Regimiento de Carros de Combate n° 2* organised during the campaign, on 1 October 1937 the '*negrillo*' tank battalion became the *Primer Batallón de Carros de Combate* (1st Tank Battalion), which saw a change in its composition on that date, now established with two tank *grupos* with three companies each, two made up of German *Panzer* Is, and one with Russian T-26 tanks captured from the enemy.

Another *Panzer* I company (number 5 and belonging to the so-called *2° Grupo*) was established at Casarrubuelos on the same date, equipped with sixteen new tanks out of the thirty that had arrived from Germany by early September. So as to avoid the administrative problems involved by the diverse origins of the personnel, and in order to give financial and prestige incentives by qualifying the unit as 'storm troops' since 12 February 1938, the *Generalissimo's* HQ decreed the administrative transfer of all the personnel of the *Primer Batallón de Carros de Combate* to the Spanish *Legión*. Two weeks later it was placed entirely under the command of the *2° Tercio de la Legión*[3], designated as the *Bandera de Carros de Combate de la Legión*[4].

On 1 October, because of the ever-growing size of the theatre of operations, the *grupos* making up the *Bandera de Carros de Combate* scaled up their establishments, were supplied with rear repair echelons and saw their personnel figures strengthened. These *grupos* became *batallones,* and the units of the *Bandera de Carros de Combate* not included in the *grupos* remained with the same designations and compositions except for the Workshops Company, which was considerably reinforced and often supported by the Vickers mobile workshops. As a result of these changes, the *Bandera de Carros de Combate de la Legión* became the *Agrupación de Carros de Combate de la Legión*, a designation that was kept to the end of the conflict.

Rear view of Panzer I Ausf. A number 223. This was the third tank of the Second Company of the 2º Batallón of the Agrupación de Carros de Combate of the Spanish Legión. This designation was maintained till the end of the Civil War. (Aballe, via L. Molina)

THE '*NEGRILLO*' TANKS

Much has been written on the tanks supplied by Germany to the Nationalist side during the Spanish conflict. Perhaps too many works have been published but certainly few have managed to determine the real extent of the German armoured contribution to the Spanish Civil War.

The total number of tanks supplied to the *Gruppe Thoma* through the *Legión Cóndor*, i.e. the tanks supplied by Germany to the land contingent for organisation and operations at the beginning of the conflict, was seventy-two, which arrived in Spain in three separate shipments of forty-one, twenty-one and ten tanks respectively.

The first shipment of forty-one tanks of the *Panzerkampfwagen* I type arrived on the SS *Pasajes* and

After their arrival in Seville on German ships, the Panzerkampfwagen Ausf. As were sent by rail to Cáceres, where the main armoured unit that took part in the Spanish Civil War was being organised. (Aballe, via L. Molina)

Although twenty-one of the 122 Panzer Is sent by Germany to the Nationalists during the Spanish Civil War were of the Ausf. B model, pictures showing this variant of the German tank do not abound. This image shows the crew of an Ausf. B surrounded by Spanish and German troops. (Aballe, via L. Molina)

An excellent photograph of a Panzer I Ausf. A marked 'F' belonging to the 2º Batallón of the Agrupación de Carros de Combate of the Spanish Legión. This tank was knocked out by enemy fire and was captured by the Republicans in reasonably good condition. (L. Molina collection)

Girgenti in October 1936, along with the German personnel and the rest of the *matériel*, all of which was used to establish the first units of the Nationalist *Batallón de Carros de Combate*. Although surviving documents do not record any specific mention regarding these tanks, it is logical to think that they included at least three command tanks, one for the battalion and another one each for the two companies established. These tanks were used to equip two full companies, of three sections with five tanks each plus one for the company CO, which made a total of thirty-three tanks, i.e. thirty combat tanks and three command tanks. Of the eight remaining, one was for driver training, known as '*Ohne Aufbau*' in German, or without superstructure or turret and intended for use on driving courses. The other seven were kept as reserves to make up the expected combat losses of the unit, later to be assigned to the so-called *Compañía de Depósito* – Storage Company. All the tanks in this batch, excepting the command tanks, belonged to the Ausf. A variant, called 'Krupp' in Spain because of their power plant.

The second batch of German tanks arrived in Spain by late November 1936 – twenty-one *Panzer* Is, probably of the *Ausf. B* variant. Fifteen of them, plus a command tank, were used to establish the third company of the Nationalist *Batallón de Carros de Combate* in December. A further five were kept as reserves to make up losses. Finally, *Legión Cóndor* documents record a third batch of ten *Panzerkampfwagen* I tanks, although both the delivery date and the tank variant supplied remain unknown. It is possible the arrival date may have been early 1937, so to make up the losses so far recorded.

In summary, this accounts for the 72 tanks sent to Spain through the *Legión Cóndor*.However, intense battlefield use and the losses suffered in the Spanish conflict made these 72 tanks insufficient to keep the unit operational, so the Spanish military authorities decided to ask Germany for larger numbers of Panzers.

The corresponding requests were transmitted through the Spanish-German HISMA Ltda. Company, the first on 13 July 1937 and the second on 12 November 1938.

In the main square of a village somewhere in Spain, tanks, improvised armoured trucks, pick-ups, lorries and draft animals assemble with Spanish tank crews and infantry. (via L. Molina)

The first request was transmitted by the *Generalissimo's* HQ, which asked *General* Sander (Sperrle) to try and speed up the delivery of the thirty tanks ordered in Berlin, as well as additional *matériel* including fifty 3.7 cm *Pak* 35/36. The mediation of the head of the *Legión Cóndor* must have been decisive as eighteen *Panzer* I *Ausf. A* tanks arrived by sea at the Arsenal at El Ferrol on 25 August. Five days later, on 30 August, the other twelve tanks making up the thirty requested arrived in Seville. All of them were sent to Cubas de la Sagra, where a 16-tank company was established. The rest were kept as reserves to fulfil the needs of the companies to make up combat losses.

The second request, transmitted through *Major* Wilhelmi, the German liaison officer between the *Gruppe Imker* and the *Generalissimo* HQs, asked for "*... 20 German tanks, some of them armed with 20-mm gun or larger calibre.*"

This request was met with a positive response and the twenty tanks ordered were delivered to the *Agrupación de Carros de Combate* on 20 January 1939, all of them of the *Panzer* I *Ausf* A type. This armoured *matériel* completed the total supplies that the Germans sent to Spain during the Civil War, a total of 122 *Panzerkampfwagen* Is of the *A, B* and command (*Panzerbefehlwagen*) variants.

By early 1937, the light weight of these tanks and their lack of firepower with which they were able to confront their Russian adversaries, which were fitted with powerful 45 mm guns, impelled the Nationalist command to study fitting 20 mm guns on Italian (Fiat-Ansaldo CV-33/35) and German (*Panzer* I *Ausf* A) tanks. After fitting Italian Breda 20 mm machine cannons to both tank types it was concluded that the German tank achieved the best performance, and the modification of one tank for each of the existing sections was ordered. Thus it was intended to improve the offensive capacity of the Nationalist armoured units, clearly outclassed in numbers and quality by their Republican opponents.

A total of four *Panzer* I *Ausf As* were thus modified, although the capture and phasing in of a certain number of Soviet T-26Bs made the transformation unnecessary.

The *Gruppe Thoma* supplied the tank unit with an anti-tank gun company for combined operations for support against enemy tanks. That company was made up of eight anti-tank guns known as 3.7 cm *Panzerabwehrkanone (Pak)* 35/36, all of them equipped with Krupp L-2H43 Protze off-road tractor trucks, and a further five guns, which were carried on trucks, for independent operations.

Apart from this company, which formed part of the tank unit, Germany sent nearly 300 guns of the same type and calibre to Spain in several shipments. These were used to establish a powerful *Agrupación de Cañones Antitanque* (Anti-Tank Gun Group) which operated on the different fronts during the Civil War. Apart from the German *matériel*, it used Russian 45/44 mm guns and other types, all of them captured from the Republicans.

1. Diminutive of *negro*, black in Spanish, a nickname that the Spanish applied to all German personnel and equipment.
2. Major.
3. A *tercio* –literally, one third– is about the size of a regiment.
4. A *bandera* – literally, flag – is about the size of a battalion.

The Polish Campaign

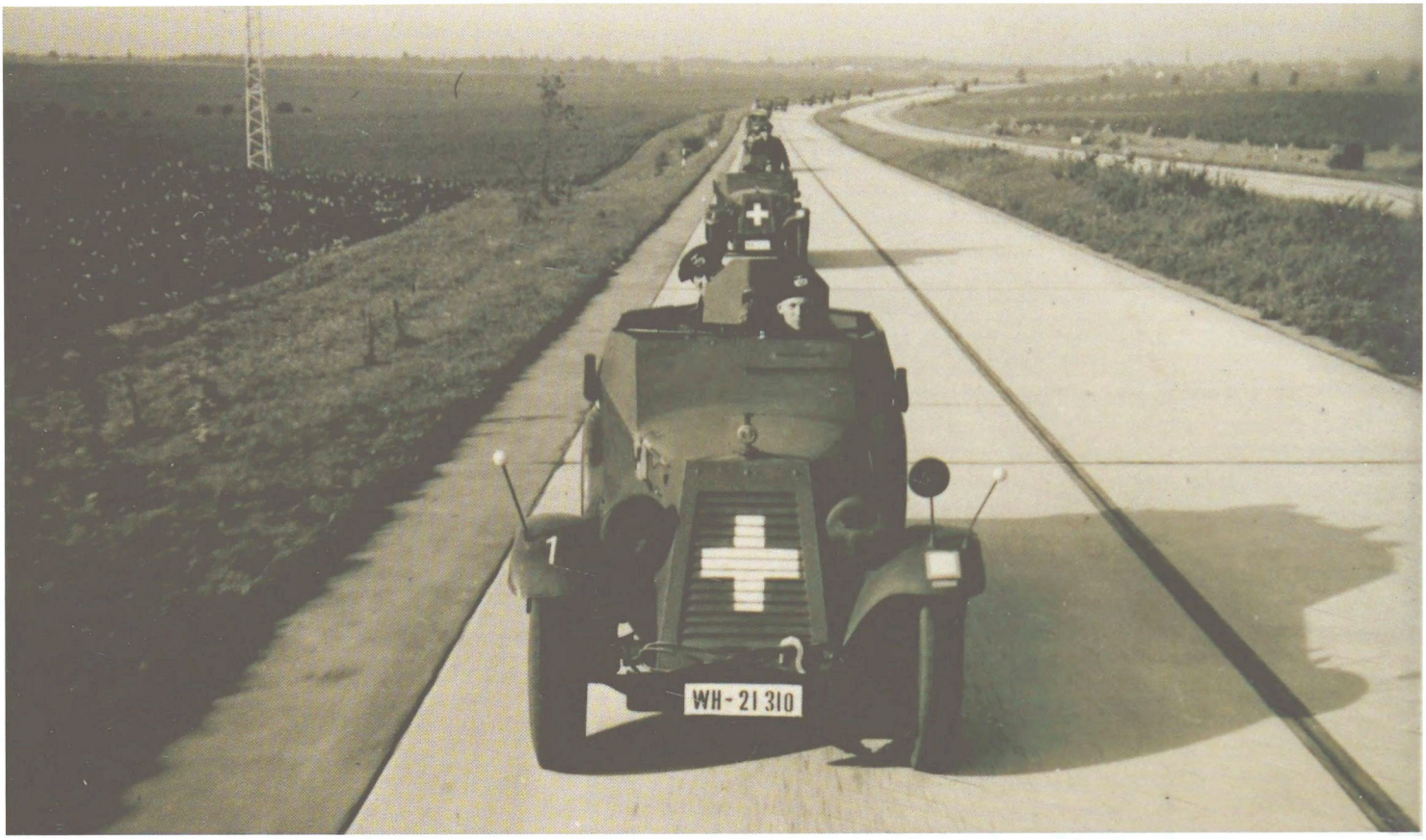
Pz II Ausf b advancing in Poland. Their white crosses are almost completely obscured. (Prigent Collection)

by William Russ

THE invasion of Poland in September 1939 would give the Panzer arm its first test of combat. All of its pre-war training and experience in the Spanish Civil War would confirm whether the doctrine of armoured warfare the Germans had adopted would prove to be an effective battlefield weapon. Of course, General Guderian and the other Panzer advocates in the German Army were not pleased by this sudden thrust into war as the tank force Germany had built up by mid-1939 was mostly made up of light tanks. The *Panzerkampfwagen* I and II models were only intended as training tanks until more suitable models became available. There were a few main battle tanks available: production of the *Panzerkampfwagen* III and IV models had just started but was not scheduled to reach full production until late 1940, and it was not until 1942 that the Panzer divisions were expected to be fully equipped for war. Part of this lack of medium tanks was, however, made up by the acquisition of the Czech Army's inventory of tanks in 1938. The *Panzerkampfwagen* 35(t) and 38(t) tanks were well-armed and robust tanks. Even though these were not quite what the Panzer enthusiasts wanted, the Czech tanks went on to give the Germans good service over the next two years.

For the invasion of Poland the Germans deployed seven Panzer divisions; the 1st, 2nd, 3rd, 4th, 5th, 10th and *Kempf*. The first five were pre-war Panzer divisions consisting of one Panzer brigade with two Panzer regiments, one motorised infantry regiment with two infantry battalions, one motorised artillery regiment with two artillery battalions, one armoured reconnaissance battalion, one motorised anti-tank battalion, one motorised engineer battalion, one motorised signals battalion, and the motorised divisional services which consisted of one motorised supply battalion, two motorised food service companies, one motorised medical company, one Panzer repair workshop, one motorised police unit and one motorised postal unit. In addition, the *1.*, *2.*, *4.* and *5. Panzer Divisions* were assigned a *Luftwaffe* motorised anti-aircraft battalion for the duration of the campaign. The *5. Panzer Division* had an additional motorised infantry regiment attached for the campaign and the *1.*, *2.* and *3. Panzer Divisions* had motorcycle battalions attached as part of their normal organisation. As can thus be realised from the above, the pre-war Panzer divisions had a standard organisation, but were reinforced with additional forces to meet anticipated operational needs.

The *10. Panzer Division* was a recent creation, being formed in April 1939, and was used as an occupation force in the newly acquired Czech territory. The *10. Panzer Division* had only one Panzer regiment with two Panzer battalions, one motorised infantry regiment with three motorised infantry battalions[1], one motorised artillery regiment with two artillery battalions, one armoured reconnaissance battalion, one motorised anti-tank battalion, one motorised engineer company, divisional services (the same as the other Panzer divisions) and one *Luftwaffe* motorised anti-aircraft battalion. The division moved north from Prague in August to reinforce Guderian's corps in Pomerania. The *Panzer Division Kempf* was an even more recent creation, having been formed in East Prussia in July 1939 to suit the OKH's desire for a Panzer unit in East Prussia to support the 3. *Armee's* advance into Poland. Since the division was late in assembling, it was the size of a reinforced Panzer brigade. *Panzer Division Kempf* consisted of one Panzer regiment with two tank battalions, one SS motorised infantry regiment with three infantry battalions, one SS motorised



A column of Kfz 13 armoured cars in Poland. Judging by their clean state, the lack of helmets and the happy faces of the crews, these are on the way back to Germany after the fighting was over. Careful examination of the original print shows the boundaries between the grey and brown camouflage paints. The tactical markings are unusual and must show a survival of their unit's original improvised marking before the 1938 regulations laid down an official list of markings. The crew's black uniforms and bulky berets are also unusual, normally being reserved for Panzer crewmen. Possibly this car was still operated by a Panzer unit, though all were supposed to have been removed from Panzer reconnaissance units before the Polish campaign. (Prigent Collection)

artillery regiment with two artillery battalions, one SS motorised anti-aircraft company, one SS armoured reconnaissance battalion, one motorised anti-tank battalion, one motorised engineer battalion, one SS motorised signals battalion and the full complement of divisional services.

There were also other German divisions that contained tanks and these were the Light *(Leichte)* Divisions. The four light divisions were formed in the late 1930s to placate the still strong cavalry element in the army. They were envisioned to function like the horse cavalry division, mainly in reconnaissance and pursuit roles. The standard division was organised as follows: one Panzer battalion, two motorised infantry regiments with two infantry battalions each, one motorised artillery regiment with two motorised artillery battalions, one reconnaissance regiment with one armoured reconnaissance battalion and one motorcycle battalion, one motorised engineer battalion, one motorised signals battalion and the divisional services consisting of one motorised supply battalion, one motorised medical company, two food service companies, one motorised police unit and one motorised postal unit.

By the start of the Polish campaign the light divisions' organisation had been modified to reflect the operational changes in their missions. The *1. Leichte Division* had its tank strength considerably increased from a battalion to a regiment of three tank battalions and a *Luftwaffe* motorised anti-aircraft battalion was added. The *3. Leichte Division* lost a motorised infantry regiment, but had its motorcycle battalion shifted to support the other infantry regiment. The *4. Leichte Division* was also reinforced by a *Luftwaffe* anti-aircraft battalion, leaving the 2. *Leichte Division* as the only light division with a standard organisation.

For deployment, the largest numbers of Panzer divisions were concentrated under the command of Army Group South as this was where the major axis of attack into Poland would be made. The army group's *10. Armee* contained the *1.* and *4. Panzer Divisions* along with the *1., 3.* and *4. Leichte Divisions*. The *14. Armee* contained the *2.* and *5. Panzer Divisions* along with the *2. Leichte Division*. Army Group North had the 3. *Panzer Division* and *Panzer Division Kempf* with the *10. Panzer Division* in strategic reserve. This deployment reflected the army's reluctance to concentrate any mechanised forces larger than a corps, much to Guderian's and the other armoured enthusiasts' chagrin. Several senior officers in the German high command were still wary of the claims by the Panzer advocates. They felt the infantry and the artillery were going to be the decisive arms in this and any future campaigns and, therefore, tried to relegate the Panzer formations to secondary roles. In numbers, the Germans had a total of 2,481 tanks deployed for front line service[2]. Broken down by type there were 934 Panzer Is, 1,098 Panzer IIs, 87 Panzer IIIs, 195 Panzer IVs, 112 Panzer 35(t)s and 55 Panzer 38(t)s[3]. In comparison, the Polish Army only had 615 tanks and the majority of these were light tankettes distributed amongst the infantry divisions and cavalry brigades. The Poles had only organised two mechanised brigades before the war[4], thus the threat to the Germans having to face masses of enemy tanks was minimal.

These two Pz I Ausf As are seen in Poland in September 1939. Both have the 'Mercedes star' of 4 PzDiv on the drivers' front plates. Note also the white crosses obscured with mud and the black rhomboid plate on the side of the nearer tank with the tactical number 815, denoting tank 5 of 1 Platoon, 8 Company. Each battalion of a regiment had four companies, so this tank belongs to the second battalion though it is impossible to say whether it belongs to PzRegt 35 or 36. (Prigent Collection)

Here Pz I Ausf A 825 follows in exactly the same place and shows that the tanks of this regiment carried large numbers on their turret rears. In front of it is a Pz II Ausf A or B with tactical number 811 on a rhomboid plate at the rear and on the turret sides, with a cross on the turret rear and a white air recognition rectangle on its engine deck. Between them, these two photographs show that the Regiment marked its tanks with the usual rhomboid plates, crosses and air recognition markings but also used large numbers on the rear flanks of their turrets with a cross between them. All the tanks are very dirty, but the original prints do show traces of the boundaries between their grey and brown camouflage areas. (Prigent Collection)

At first the German Army did not meet much resistance from the Polish Army when the invasion started on 1 September. The Poles made the decision prior to the invasion to make their main line of resistance twenty to thirty kilometres beyond the Polish-German border, as the Polish high command knew that they could not man the entire border. This was done in an effort to shorten the line the Polish forces would have to defend. The lone exception was to defend the Polish Corridor, a decision made for purely political reasons. This is where Guderian's XIX Corps was assigned the mission to cross the corridor and isolate the Polish forces holding it. In the early morning hours of 1 September the *3. Panzer*, *2.* and *20. Motorisiert Infanterie* (Motorised) *Divisions* crossed the Polish-German border east and south of Chojnice without much resistance. However, it was not long before the *2. Motorisiert Infanterie Division* had become entangled in a Polish defensive belt south of Chojnice and was not able to move forward until the next day. The *20. Motorisiert Infanterie Division* made better progress by bypassing Chojnice to the north. However the division halted its forward progress, not wanting to have an open flank while the 2nd Motorised was stopped. The *3. Panzer Division* itself ran into a couple of anti-tank positions, but these were quickly dealt with. By the afternoon, the Panzer division had reached the Brda River, which was the halfway point across the corridor. The 3rd Panzer's reconnaissance battalion quickly crossed this obstacle and raced ahead, closely

These two Pz I Ausf Bs in Poland carry no unit identification, but the tactical numbers beginning '1' show that they belonged to the staff of the first battalion of their regiment. The lack of any crosses on the nearer tank is intriguing, perhaps meaning that it was a replacement drawn from reserves too quickly to be marked with crosses. The cursive '1' on the front tank is probably a personal marking. Both tanks carry smoke candle ranks mounted on their exhaust silencers, and are too dirty to see any evidence of their two-colour camouflage. (Prigent Collection)

followed by the Panzer regiments. The reconnaissance battalion forged ahead, marching into the night. By late evening the reconnaissance battalion had reached the town of Swiecie on the Vistula River, thus in one day crossing the entire corridor and cutting off the majority of the Polish forces in the corridor. This penetration was a tenuous one and would have to be reinforced over the next couple of days.

The 3. *Panzer Division's* two battlegroups[5] closed in on the Vistula River, both reaching the river by late on 3 September and followed closely by both motorised divisions and the 23rd Infantry Division. Once the XIX corps had established firm contact with the 3. *Armee* forces across the Vistula, the corps turned its attention to the Polish forces left in the corridor. From 3 to 4 September the 2. and 20. *Motorisiert Infanterie Divisions*, plus other infantry divisions of the 4. *Armee*, fought to eliminate the remaining Polish forces in the corridor pocket. The Poles made several desperate attacks to break out of the encirclement, but most of these were beaten back. By the evening of the 5th most of the Polish defenders had either been killed or captured.

With the end of organised resistance in the corridor, the XIX Corps, along with other units of the 4. *Armee*, were transferred by rail over 6 to 9 September to assembly areas in eastern East Prussia. It was planned that the XIX Corps would form the northern pincer as part of a grand flanking manouevre to trap Polish forces east of the Vistula River. Army Group South's XXII Corps was to be the southern pincer moving north out of the Galicia region. Both forces were to manouevre to eventually meet along the Bug River south of Brest Litovsk. By 8 September most of the XIX Corps had assembled around the Masurian Lakes region and kept its original order of battle plus the 10. *Panzer Division*. Von Bock was eager to get the XIX Corps' attack underway as soon as possible because the Poles were evidently disengaging from the German forces east of the Vistula River to form a new defensive line behind the Narew and Bug Rivers. This new defensive line could wreck any possibility of the strategic envelopment envisioned. Only the 10. *Panzer* and 20. *Motorisiert Infanterie Divisions* were ready for combat by the 8th. The 3rd Panzer was still refitting from its losses in the corridor battles and the 2nd Motorised Division had just recently detrained. So, with the support of units of the XXI Corps, the 10. *Panzer* and 20. *Motorisiert Infanterie Divisions* forged ahead and would let the rest of the corps catch up.

The beginning of the offensive on 8 September did not get off to a good start. The 10. *Panzer Division* became entangled in a series of Polish bunkers just south of the Narew River on the first day. With the lead division stalled, General Guderian himself came forward to see what was holding up the advance. After assessing the situation Guderian ordered up the guns of the *Luftwaffe* Flak battalion to soften up the bunkers before the next attack. The next infantry assault, combined with the division's light tanks, successfully broke the Poles' resistance. Thereafter the division resumed its advance south with the 20. *Motorisiert Infanterie Division* following close behind.

From 9 to 13 September there was a rapid advance by the XIX Corps. The 3. *Panzer Division*, taking up the corps' left flank, passed through Bielsk Podolaski and began a larger flanking movement east of Brest Litovsk. The 10. *Panzer Division* was able to cross the Lesna River and drive straight to Brest Litovsk itself by 14 September. A battlegroup of the 10th Panzer was able to take the city, but the Polish troops that were holding the city had retreated into the city's fortress. This would have to be taken by a formal assault. It would

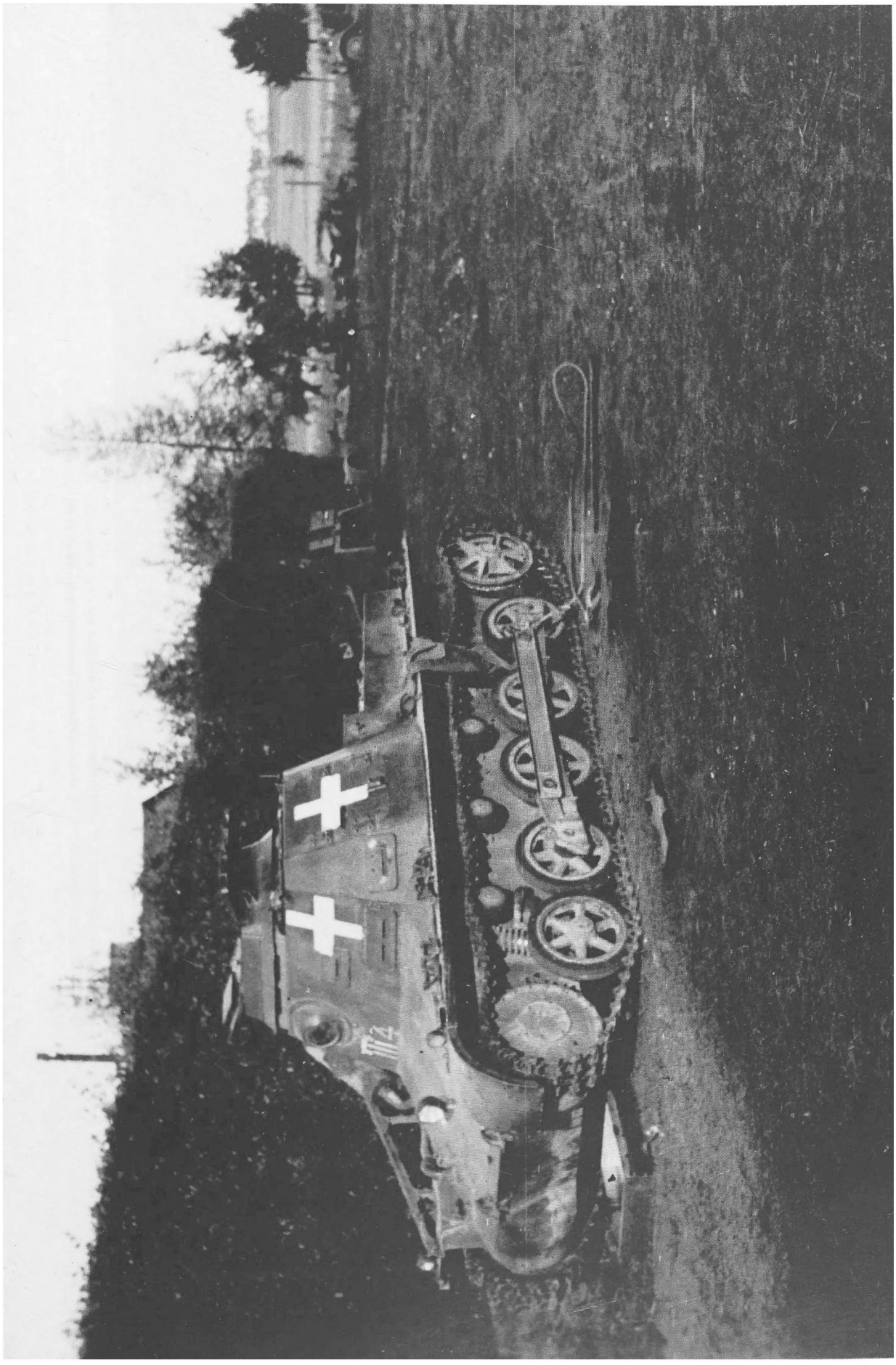
This Pz I Ausf B of 4 PzDiv gives a very clear view of the 1939 division emblem as well as showing what happened to thin armour when struck by even a small armour-piercing shell. It is curious that only the markings on the turret have been smeared with mud to reduce their visibility, leaving the bright white cross on the hull front as a clear mark for enemy gunners. Perhaps this is why it was hit? (Prigent Collection)

A Pz I Ausf A of an unknown unit with a very visible white cross on its turret rear but an obscured cross on the turret side. The latter is hard to see because it has been painted across the open vision port, but its top can be spotted above the port. This tank gives a good view of the extra engine deck armour, protecting the engine air vents, that was found necessary after experience of fighting in Spain. It also carries a smoke candle rack, which is differently-placed to the rack fitted to Ausf B tanks. (Prigent Collection)

take the combined forces of the 10. *Panzer* and 20. *Motorisiert Infanterie Division* plus *Luftwaffe* support before the Brest citadel fell to the Germans on the 20th.

While the 10. *Panzer* and 20. *Motorisiert Infanterie Divisions* were occupied reducing the Brest Litovsk fortress, the 3. *Panzer* and 2. *Motorisiert Infanterie Divisions* continued their advance east and south of Brest from 15 to 18 September to link up with the XXII Corps forces. Following the east bank of the Bug River, the 3. *Panzer Division* had driven some 70 kilometres south of Brest. The Russian invasion of eastern Poland on 18 September, however, brought an abrupt end to this drive and all offensive movement was suspended.

These Pz I Ausf As are seen with captured Polish 7TP tanks at a collection point on 24 September 1939. The nearest Pz I has the white air recognition rectangle on its engine deck armour, and all three show variations of the cross – one white, one white filled in with what appears to be yellow, and one with an apparently yellow cross inside the white one. (Prigent Collection)



A Befehlspanzer I Ausf B command tank in Poland, September 1939. Its grey and brown camouflage pattern is visible, and it carries the tactical markings of a towed artillery unit in white with a yellow figure 4. (Prigent Collection)

All of the Pz II Ausf b in this column have their white crosses obscured with mud and carry white vertical stripes on their turret rears, several painted over the muddied crosses. These seem more likely to be for visibility on night marches than figure 1s. (Prigent Collection)

An Pz III Ausf B is seen in Poland in September 1939.

The yellow tactical number 04 after a Roman II indicates that it belongs to the HQ of the 2nd battalion of its regiment, but since it carries no division sign the actual unit cannot be identified. (Prigent Collection)

Panzerkampfwagen III B

Weight: 16 tonnes
Crew: 5
Engine: Maybach HL 108 TR, 250 HP
Speed: 35 km/h
Armament: 1 X 3.7 cm KwK, 2 X 7.92 MG 34
Armour: 5 to 16 mm
Length: 5.665 m
Width: 2.810 m
Height: 2.387 m
Armour: 5 to 16 mm

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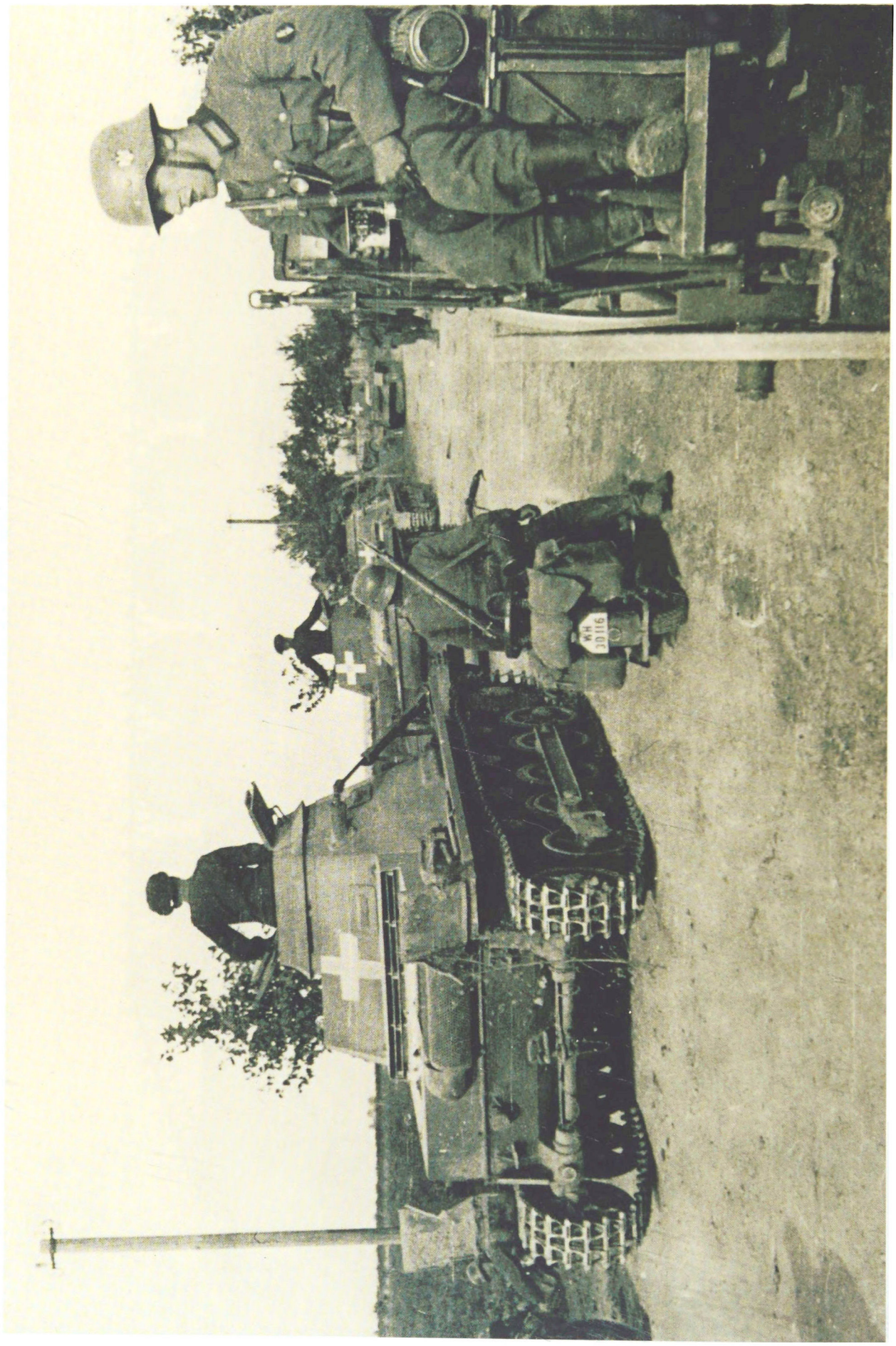


Two Befehlspanzer I Ausf B advance in Poland between Pz IIs. (Prigent Collection)

It is rare to find two photographs of the same tank, but here are both sides of a Pz II Ausf b in Poland. The dot after its tactical number probably designates the second battalion of its regiment, but no unit sign is visible. The transparent rear rhomboid plate is very unusual and must have been hard to see from az distance. The white air recognition rectangle is clearly seen on its engine deck. (Prigent Collection)

This Pz II Ausf b and the Pz I Ausf As behind it are from Panzer Divison Kempf. Just distinguishable behind them are at least two Pz II Ausf c with five larger roadwheels. The men at the roadside are from SS Infantry Regiment Deutschland. It is possible that the two white dots on the bow of the Ausf b are a division insignia for this temporary division. (Prigent Collection)

This brought an end to the XIX Corps active participation in the campaign and it was soon withdrawn to East Prussia. For its part the *3. Panzer Division* had performed well in the campaign. The division swiftly closed the Polish corridor and aided in the destruction of the Polish troops trapped in the corridor's pocket. In their second phase of the campaign the *3.* and *10. Panzer Divisions* drove deep into the Polish rear sowing confusion and destruction along the way. The 220 kilometre march over an eight-day period by *10. Panzer Division* that cumulated in the capture of Brest Litovsk was a most impressive feat. Guderian's corps showed what well-handled motorised troops could accomplish.

Tasked with driving into the heart of Poland, the *10. Armee's* mission was to be the decisive axis of attack with Warsaw as its ultimate objective. Given this importance the *10. Armee* had the highest concentration of motorised forces with the *1.* and *4. Panzer Divisions*, *1.*, *2.* and *3. Leichte Divisions* and the *13.* and *29. Motorisiert Infanterie Divisions*. The infantry divisions were initially tasked with breaking the Poles' main line of resistance, opening gaps that the following motorised divisions would exploit. Once the actual invasion had commenced on 1 September the Germans realised that the Poles were not making a stand at the border. Instead they had set up a screen of light forces (mostly consisting of cavalry, border guard and national guard units) at the border while their main line of resistance would be some twenty to thirty kilometers beyond the international border. In this case, the Germans rapidly pushed the motorised forces forward to catch the Poles before they had fully manned the main defensive line. The 1. and 4. *Panzer Divisions* did not cross the border until the early morning hours of the 1st, having to wind their way through the already clogged roads that the infantry divisions were using. It was expected that both divisions would gain more manouevring room the next day, but this would not prove to be the case for the 4th Panzer.

After crossing the border, the *4. Panzer Division* set out to reach its most immediate objective of crossing the Warta River by the evening of the 1st. However, the division soon ran into a defensive screen set up by the Polish Wolynska Cavalry Brigade at Opatow. At first tanks of the *Panzer Regiment* 35 were sent forward to disperse the Poles to their front, but this attack was repulsed by the Polish lancers' effective use of their anti-tank guns. Once the Germans had regrouped they moved forward again, only to find the Polish cavalry had fallen back to positions just east of Morka. This time the tanks of the I/36 *Panzer Regiment* attacked the Polish positions with infantry support, but even this assault was repulsed by the enemy's anti-tank and field artillery, forcing the Germans back to Wilkowicko. By noon the bulk of the division had moved up between Opatow and Morka. *General* Reinhardt ordered a general attack on Morka by 13.00 hrs that would include tanks, infantry and artillery. In the division's centre at Rebielice the I/12 Motorised Infantry Regiment with artillery support advanced against light enemy resistance and moved through the forest until it encountered Polish cavalry and an armoured train at the rail line. By 15.00 hrs the main attack on the Morka defenses commenced with the *Panzer Regiment 35* on the right and the *Panzer Regiment 36* on the left. This time the Germans overran the Morka position but were again stopped by a stubborn Polish defense at the rail line west of Morka, taking heavy losses in tanks. After probing for a weakness along the rail line one was found south of Morka. The Germans took immediate advantage of this and funneled the I and II/35. *Panzer*

A column of Pz I and II of several Ausfs in a Polish field, awaiting the order to advance. (Prigent Collection)

This Pz II may be Ausf c, A or B – they cannot be told apart at this angle. It is crossing an engineer bridge in Poland and has the unusual marking of a skull and crossbones on its glacis. (Prigent Collection)

A Pz II at the victory parade in Gdansk (Danzig) in October 1939.(Prigent Collection)

Regiment tanks through this hole, eventually taking them to Miedano well into the enemy's rear. At the same time the 12th Motorised Infantry Regiment launched another attack at the divisions centre at Wilkowiecko, pushing the Polish defenders back to the rail line south of Morka. Both of these attacks finally forced the Poles into a general retreat as this left the rest of their positions outflanked.

The 4. *Panzer Division* had finally forced the Poles back, but at a heavy cost in tanks and men. This first day's action was not a tactical success on the 4th Panzer's part. It showed that the tactical mishandling of attacks on the Germans' part against a battlefield-aware defence by the Poles would mean rough going for the Panzer forces. Meanwhile the *1. Panzer Division* had a much easier time in its initial combat debut. Moving south of the 4. *Panzer Division*, the 1st Panzer crossed the border on 1 September at the Liswarte River against light resistance. With the Division's reconnaissance leading the way, the division reached the outskirts of Klobuck by early evening. The 1st Panzer's infantry deployed south of Klobuck, assaulted the Polish positions and quickly routed the Poles out the town by 20.00 hrs. In comparison to the *4. Panzer Division*, the 1st Panzer's advance from the border to Klobuck was relatively easy with few losses in men and equipment. By the morning of 2 September both divisions prepared to make the turn north to cross the Warta River.

From 3 to 6 September, both Panzer divisions advanced in parallel up the Czestochowa-Warsaw highway, chasing the retreating Polish forces through Radomsko and Piotrkow. Because of their rapid advance both divisions had become strung out along the march route. Supply became spotty for the forward units, and to make matters worse bypassed Polish units were attacking the rear service units. Also Army Group South headquarters was becoming nervous about the Panzers' headlong thrust and wanted *General* Reichenau, the 10. *Armee* commander, to rein in both divisions to allow the infantry to catch up with them. These fears were calmed however, once the army group got a clear picture of the situation on what was

These Pz II Ausf c, A or B of 4 PzDiv have their white crosses very neatly filled in with what appears to be yellow. The division sign is faintly visible beside the driver's vision port of the tank on the right. (Prigent Collection)

This Pz II in Poland has unusually small turret numbers and displays. its white air recognition rectangle across the engine instead of along it. (Prigent Collection)

Pz II Ausf c, A, B or C of PzDiv Kempf advance toward Zelechow, 80 km south-east of Warsaw. The front tank has its turret-front cross obscured but not the side one, while the rear tanks have plain white crosses. (Prigent Collection)

A Pz II Ausf E on a tank transport trailer. The only markings are its white Polish Campaign crosses. (Prigent Collection)

This Pz III Ausf C has lost its central roadwheels, giving a good view of the suspension spring and swingarms. It has no division emblem so its unit cannot be identified. (Prigent Collection)

A Pz III Ausf D shares this repair park in a Polish town with several Pz IV Ausf C and trucks. (Prigent Collection)

This Pz III Ausf D in Poland is unusual in having no visible cross on its turret side, though an arm of one is just visible on the turret rear. (Prigent Collection)

A Befehlspanzer III Ausf D1 of an unidentifiable unit in Poland. (Prigent Collection)

These tanks of 4 PzDiv were fully prepared for the invasion of Poland at Neuhammer on 23 August 1939. Lined up behind the Befehlspanzer III Ausf D1 numbered R01 is a Befehlspanzer I Ausf B numbered R02, with a Pz II Ausf c, A or B behind that. (Prigent Collection)

happening at the front on the 6th. Both Panzer division commanders had relayed through the 10. *Armee* headquarters that, even though they had some supply difficulties together with some security issues along the march route, their forces were still in good enough shape to continue their advance on Warsaw. In that case, *General* Reichenau gave both commanders the go ahead to continue their advance. The XVI Corps would remain the 10. *Armee's* spearhead while the VII and IV Corps provided flank protection as best they could.

It was on 7 and 8 September that the 4. *Panzer Division* made its remarkable march on the Polish capital. *General* Reinhardt launched the division forward from its positions just north of Piotrkow on the morning of 7 September with the 5th Panzer Brigade leading the way. The 5th Panzer Brigade rapidly advanced up the main road, bypassing Tomaszow Mazowiecka, shooting up retreating Polish columns along the way. The brigade stopped at Rawa Mazowieka to laager for the night. The next morning the divisions advanced guard set out for Mszconow and once again found little or no Polish forces in its path. By noon the 5th Panzer Brigade had taken Mszconow then halted momentarily to regroup and awaited its final orders to advance on the Polish capital. In the afternoon *Generals* Reichenau and Hoepner came forward to Reinhardt's divisional headquarters for a meeting to discuss whether the 4th Panzer should wait for reinforcements or attempt to take Warsaw by itself. *General* Reinhardt stated that the 4th Panzer was more than capable of taking the capital by itself, especially since intelligence indicated there were few or no major Polish formations between the division and Warsaw. Combining this with the fact that the Poles were putting up little resistance and retreating across the whole front made it more than plain to Reinhardt that the city was theirs for the taking. Both *Generals* Reichenau and Hoepner concurred, as they had already been briefed by the army and army group's intelligence sections who agreed with Reinhardt's assessment. All three worked out the details for the anticipated advance and occupation and the orders were issued.

The 5th Panzer Brigade set out for Warsaw once again at around 14.00 hrs with one battlegroup leading the division up the main highway while a second battlegroup assumed the division's left flank. The first group was composed of the 5th Panzer Brigade headquarters, *Panzer Regiment* 35, 12th Motorised Infantry Regiment, 103rd Motorised Artillery Regiment, 49th Motorised Anti-tank Battalion (minus its 3rd company) and one battalion from the *Panzer Regiment* 36. The second group was composed of the 33rd

A company column of Pz IVs move along a Polish road. The closest tank is an Ausf A, while those in front of it are Ausfs B or C. The legible tactical numbers are all from the 8th Company of their battalion and the bars under the numbers indicate the second battalion of their regiment, but no unit emblems are visible. A car is partially seen on the extreme right carrying the tactical sign for a signals platoon, but its divisional emblem is out of the photograph. (Prigent Collection)

Two Pz IV Ausf B in Hitler's victory parade in Warsaw. (Prigent Collection)

Pz IV Ausf Bs reentering Paderborn, their garrison town, in triumph on return from Poland, 23 October 1939. (Prigent Collection)

A Pz IV Ausf A crossing a rough bridge in Poland. No unit emblem or tactical numbers are carried. (Prigent Collection)

Infantry Regiment (minus one battalion), *Panzer Regiment* 36 (minus one battalion), 627th Motorised Artillery Regiment with two battalions, the 62nd Engineer Battalion and the 3rd Company of the 49th Anti-tank Battalion. It was not long before the main battlegroup had reached the suburbs of Warsaw. It was at Mokotow and Ochota suburbs that the Germans faced a stiffening of Polish resistance with heavy artillery fire halting progress. At 17.00 hrs the Germans tried one more time to penetrate the Polish positions but they were thrown back. With darkness approaching Reinhardt called off any more attacks for the day, preferring to wait for the next day when proper artillery support could be set up. The General was confident that the 4th Panzer would take the city on the 9th. But he and the fighting troops of the Division were about to find out that tanks are not well suited for urban fighting against a determined foe.

The next morning, 9 September, the German battle groups once again advanced on the Polish positions and almost immediately the attack stalled. The Poles had erected numerous barricades with anti-tank traps and mines in the narrow city streets. This funneled the German attacks into small kill zones that forced the Germans into easily containable areas. By 09.00 hrs *General* Reinhardt had called off all attacks placing the division on the defensive. It was clear to Reinhardt that he would need more infantry and artillery before the city could be taken. High losses of tanks in the past few days fighting in an urban environment had shown that without the other supporting arms, attacking with tanks alone was suicidal. Also the Division's supply route was stretched to the limit and was under constant attack by roaming bands of Polish troops trying to escape the ever-tightening noose the Germans were forming west of Warsaw. When the Division was ordered to make its run on Warsaw, the *31. Infanterie Division* and the SS *Liebstandarte* motorised Infantry Regiment were to close up as fast as possible to protect the 4th Panzer's rear and lines of communication. It would be several days before the *Panzer Division's* positions were secured by the follow-up divisions.

In the meantime, on 7 September, the *1. Panzer Division* had been detailed by the *10. Armee* to pursue Polish forces seeking refuge east of the Vistula River below Warsaw. The division turned east at Tomaszow Mazowiecka following the north bank of the Pilica River, finding very few sizeable Polish units in its path. On the 8th the division turned north to support the 4th Panzer's right flank south of Warsaw. By the time the *1. Panzer Division* had arrived, the *31. Infanterie Division* had taken over the positions previously occupied by the *4. Panzer Division*. For the next ten days both Panzer divisions participated in the Bzura battles, mostly in a supporting role for the infantry. Once the Polish forces in the Bzura pocket had been eliminated both divisions went into the army group's reserve, ending their active participation in the campaign.

In sum, both Panzer divisions had performed well for the task assigned to them even though there were tactical lapses in judgement at times, especially at Morka and in front of Warsaw. Still, the 4th Panzer's remarkable march on Warsaw on 7 and 8 September was an example of what a Panzer division was capable of with the right leadership.

Because of the *14. Armee's* secondary role in the invasion of Poland its Panzer divisions were also assigned secondary roles, which essentially meant they were to play a subservient role to the infantry divisions. This was evident by the deployment of the Panzer and light divisions at the beginning of the campaign. The 5. *Panzer Division*, along with the SS *Germania* motorised Infantry Regiment, were deployed under the VIII Corps command to support the infantry divisions advance into Polish Silesia. The 2nd Panzer and 4th Light Divisions were also expected to fill this role advancing out of the Tatra Mountains. But the XXI Corps commander, *General* Ewald von Kleist, had other ideas for the use of his two divisions[6]. Even though *General* Kleist was an old cavalry officer from his days under the *Kaiser*, he saw the potential of the new mechanised divisions and was determined to make the fullest use of their mobility.

In the opening days of the campaign the 2nd Panzer and 4th Light Divisions made their way through the mountain roads facing only border guard and national guard troops. The German advance was initially slow because the Poles made effective use of mines, destroyed bridges and tree barriers along the narrow roads. By late on 3 September both divisions had finally broken through to more open country. To counter the Germans, the Poles had moved the 10th Mechanized Brigade from its reserve position near Krakow to slow their advance. By the morning of the 4th, Colonel Maczek, the 10th Mechanized commander, had positioned the brigade behind the Skawa River between Jordanow and Rabka to block the German advance up the main road. The 2nd Panzer Division assailed these positions without success in the morning hours, reformed, and attacked again in the afternoon. This attack was more successful as the Poles were forced back in the evening hours. Colonel Maczek's force fell back to positions just south of Myslenice, regrouped and awaited the 2nd Panzer's arrival. In due course the 2nd Panzer moved up and assaulted these positions. This time the Poles could not hold their positions as they had suffered many casualties the day before. The 10th Mechanised fell back towards Tarnow throwing up rearguards to slow the Germans down. The 2nd Panzer, however, did not follow up its success since it was ordered, along with the *4. Leichte Division*, to turn east as the 14. *Armee* had determined that it was more important to seize bridgeheads over the Dunajec River.

From 4 to 9 September, the *4. Leichte Division* took over as the XXII Corps lead division, crossing the Dunajec River at Tuchow on the 6th. The 4th Light then formed two battlegroups, one on the left that moved north to bypass Tarnow and the other advanced on Debica. The 2nd Panzer itself had been held up when several stray enemy groups set upon the division's rear service elements near Bochnia. Because critical fuel had been destroyed, the tanks had to halt while other fuel columns had to be rerouted through the more

A Pz IV Ausf C of an unknown unit with tactical number 321. (Prigent Collection)

This Pz IV Ausf C is parked in the square of a Polish town. The fighting here is evidently over and the townspeople have come out to have a look at the German vehicle. (Prigent Collection)

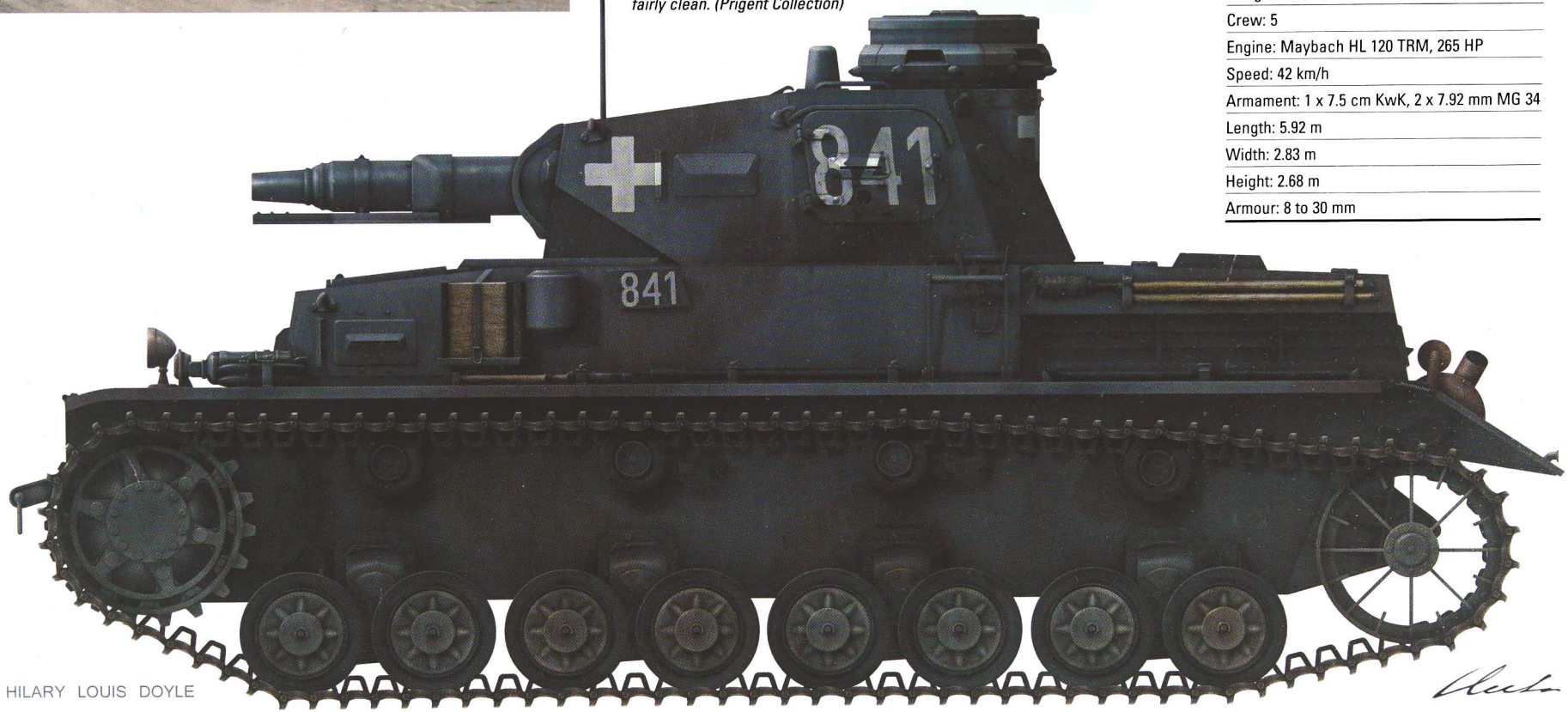
A Pz IV Ausf C entering Tomaszow, Poland, in September 1939. Several Panzer and Light Divisions passed through this town so it is impossible to say which one this tank belonged to, though 4 PzDiv seems unlikely because it used its 'Mercedes star' on its tanks and no such emblem can be seen. Although damage to many buildings is evident, those in the background appear untouched. (Prigent Collection)

This Pz IV Ausf C, surrounded by curious infantrymen, has the name Anni on its bow. Although not officially allowed, the naming of tanks was permitted occasionally. (Prigent Collection)

This Pz IV Ausf C of 4 PzDiv was photographed twice on the same day of the Polish campaign, which offers us the rare opportunity to confirm its full markings. The division's 'Mercedes star' is on the glacis together with a white cross. The tactical number 841 is on both turret-side hatches, and also carried on grey rhomboid plates on both superstructure sides. A white cross appears on each forward turret side, just visible in the second photograph behind the radio operator's head, and there would also have been one on the turret rear. In both photographs the gun muzzle and coaxial machine gun have their dust covers in place, the reason being obvious when the photographs are compared because although taken close together, the second one already, shows dust beginning to cover the hull front and its markings, although the sides are still fairly clean. (Prigent Collection)

Panzerkampfwagen IV C

Weight: 18.5 tonnes
Crew: 5
Engine: Maybach HL 120 TRM, 265 HP
Speed: 42 km/h
Armament: 1 x 7.5 cm KwK, 2 x 7.92 mm MG 34
Length: 5.92 m
Width: 2.83 m
Height: 2.68 m
Armour: 8 to 30 mm



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A Pz IV Ausf C of 4 PzDiv. Only '44' is visible on the turret number, but it probably belongs to the same unit as the subject of the colour profile on page 85. (Prigent Collection)

secure XVIII Corps rear area. Once the tanks were refueled and on the move again, the 2. *Panzer Division* assumed the corps' left flank using the Bochnia-Tarnow highway as its main axis of attack. It was not long before the 2nd Panzer ran into and destroyed several Polish formations along the highway. The division's lead armoured column, commanded by *Oberst* Ritter von Thoma[7], enjoyed particular success in wiping out various enemy columns along the way before having to stop at the Dunajec River because of the destroyed bridge.

On 8 September the *4. Leichte Division* began a general pursuit of the retreating Polish Army with the objective of reaching the San River. The *4. Leichte Division* moved along the major highway between Tarnow and Rzeszow and arrived at the San River at Radymno on 10 September. The Division probed for any bridges that were capable of supporting the heavy traffic that would have to be carried but found none. The *4. Leichte Division* would have to wait for its bridging columns. The *2. Panzer Division* still lagged behind in its crossing the Dunajec, its progress slowed by Polish rearguards. The Division finally came in line with the 4th Light on the 10th at Lubzczow on the San River. By the 12th both divisions had sufficient bridging equipment to force crossings, and this was accomplished by the evening hours. To help secure their gains the SS *Germania* motorised Infantry Regiment had moved up to the river crossings, as the infantry divisions were still far behind. It would be another two days of hard marching before the 44th and 45th Infantry Divisions could secure the San River bridges.

Once across the San River both divisions were ordered to manouevre their forces to link up with the XIX Corps units moving south along the Bug River from Brest Litovsk. This would trap the majority of the Polish forces still between the Vistula and San Rivers. The 2nd Panzer was given the task of forming the inner wheel of the encirclement by moving up the Jaraslaw-Tomaszow road then marching north to Zamosc. The 4. *Leichte Division* would drive east, then north to arrive at the Bug River, thus linking up with the 3. *Panzer Division* coming from the north. From 10 to 12 September both divisions moved over terrain mostly devoid of Polish forces, encountering only the occasional enemy rear service units. The 4th Light passed through Rawa Ruska on the 14th, cutting the major highway between Lublin and Lvov, covering some 60 kilometres in one day. By the end of the day the 4. *Leichte Division's* forward units had reached the Bug River thus achieving its operational goal in two days. Meanwhile the 2nd Panzer had reached its objectives by the evening of the 14th, taking Zamosc with little trouble.

These Pz 35(t) must belong to 1 Leichte Division because it was the only unit issued with them. The visible tactical number 532 places this sub-unit as II/PzRegt 11 (2nd Battalion, 11 Panzer Regiment), since the other armoured sub-unit was Panzer Abteilung 65, a single battalion. They have seen considerable service at this stage of the Polish campaign, proved by the heavy dust coat that has covered all traces of their camouflage patterns. (Prigent Collection)

This very rare photograph shows one of the Pz 35(t) converted to command tanks for PzRegt 11 and fitted with a frame aerial for its long-range radio. Unfortunately the place name written on the back of the original print is illegible. (Prigent Collection)

This Pz 38(t) with tactical number 312 is crossing a quickly-constructed diversion from a road, probably because the original surface is being repaired by the workmen seen beyond the halt sign. It may belong to 2 Leichte Division, though no unit markings are carried to confirm this. (Prigent Collection)

These Pz 35(t) are seen at Paderborn on 23 October 1939 in the parade that welcomed their return from the Polish campaign. Although they are dirty again after being cleaned before their journey, some traces of the grey and brown camouflage pattern can be seen. (Prigent Collection)

However the operational needs of the army had changed, and the two divisions were now needed for other tasks. The opportunity to destroy the large Polish force (remnants of the Army Lublin) that was moving east between Tarnow and Wieprz could not be passed up. To block the Poles' eastward movement, the 14th Army ordered the 4th Light Division to take over the 2. *Panzer Division's* position around Zamosc. This would make the 4th Light the blocking force while the infantry divisions of VII and VIII Corps would act as the 'hammer' to crush the encircled Polish forces. In due course, the 4. *Leichte Division* abandoned its bridgeheads on the Bug River, taking over the 2nd Panzers positions between Zamosc and Tomaszow by the evening of 12 September. Over the next several days the 4. *Leichte Division* (later reinforced by a battlegroup from the 2. *Panzer Division*) battled the Polish groups desperately trying to escape the ever tightening pocket. Some small Polish groups did manage to infiltrate through the 4th Light's cordon, but for the most part the division held its positions and prevented any larger groups from achieving a breakthrough.

This early production SdKfz 222 is seen in Poland on 6 September 1939. It can be distinguished from later production by its flat, simple vision port covers, the later ones being cast with a bulged shape. The mesh on top of the open turret prevented grenades being thrown inside, and folded up and to the sides to allow the crew to enter the vehicle. (Prigent Collection)

An SdKfz 221 passes through a wrecked Polish town. Like the SdKfz 222 it has a mesh screen on its open-topped turret, but flat instead of raised. (Prigent Collection)

By the 20th the pocket had been eliminated and the 4th Light was placed in the army reserve, thus ending its active participation in the campaign.

Meanwhile, the 2nd Panzer Division was sent south to help the beleaguered 1st Mountain Division that was desperately hanging on at Lvov. Leaving its positions to the 4th Light Division, *General* Veiel sent a battlegroup south that duly arrived at the 1st Mountain's positions on 18 September. But by the time the 2nd Panzer's battlegroup had fully arrived the 1st Mountain Division had been reinforced by the forces of the XVIII Corps and it was therefore not really needed. It was at this time that the 4. *Leichte Division* requested help in holding its positions around Tomaszow. *General* Veiel dutifully turned the division around and headed back to Tomaszow. A battlegroup arrived just in time to reinforce the 4th Light's positions south of Tomaszow where the Poles were making the greatest effort to break out of the pocket. Because of the timely arrival of the 2nd Panzer's reinforcements the Polish attacks failed and the line held. Except for some mopping up operations, this was the 2nd Panzer's last major operation for the campaign. By 24 September the division had been placed in the army reserve.

Overall, von Kleist was pleased with the corps' performance during the campaign. Off to a slow start after struggling through the mountains and foothills, the corps' divisions rapidly outpaced the infantry after crossing the Dunajec River. Both the 4th Light and 2. *Panzer Divisions* sowed confusion and destruction in the Poles' rear areas, greatly aiding the rapid collapse of the Polish armies in southern Poland.

For Guderian and the Panzer advocates the Polish campaign was a vindication for what they said could be accomplished by the *Panzerwaffe*. The Panzer divisions used their mobility and firepower to disrupt the Polish armies' ability to form any kind of coherent defence line, cut major communication lines, and caused general confusion in the Polish rear areas. The prime examples of this were the XIX Corps run on Brest Litovsk, the XVI Corps advance on Warsaw and the XXII Corps race across southern Poland. All of this gave the impetus to expand the Panzer arm to ten divisions after the campaign. Another positive effect was the persuasion of some of the more conservative generals on the effectiveness of the new arm.

The first battles also exposed problems. The Panzer divisions regularly outran the rest of the army's infantry forces leaving a gap that enabled large groups of Polish troops to escape encirclement. These same enemy groups also fell upon the Panzer divisions' rear units and could, as stated previously, disrupt the flow of supplies to the combat units. This is where the motorised infantry divisions could have made a difference, but they were not grouped with the Panzer divisions. They were used more to plug holes in the line with

A SdKfz 263 radio car being serviced during a pause in the Polish campaign.

It bears only the white crosses used for identification and the very low registration number WH 755. There would have been a white cross and the registration number on its hull front as well as the cross on its rear that is greatly obscured by dust. (Prigent Collection)

PzSdKfz 263 (8 rad)

Weight: 8.10 tonnes
Crew: 5
Engine: Buessing NAG L8V/GS 7.91 litre, 155 HP
Speed: 85 km/h
Armament: 1 x 7.92 mm MG34
Length: 5.85 m
Width: 2.20 m
Height: 2.90 m
Armour: 8mm

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A six-wheeled SdKfz 232 that has been hit in the engine compartment by enemy fire, with paint burnt off as a result but still showing the different tones of its grey and brown. Its cross is a rare type, neatly overpainted in grey to leave a white border. (Prigent Collection)

the marching infantry[8]. Also, not all the Panzer divisions were used to their fullest potential. The 5. *Panzer Division* and *Panzer Division Kempf* were used to support the infantry divisions they were paired with, thereby wasting their mobility. The four light divisions performed well enough themselves, but actual battlefield conditions had shown them to be too 'light' for the constant combat they were subjected to. A cross between a motorised and a Panzer division, the light divisions did not have enough tanks nor enough infantry to be a well-balanced unit. All four of the light divisions were converted to Panzer divisions after the campaign. On the tactical level there were problems with infantry and armour cooperation, but improvements were made during the winter of 1939-40. All of these lessons would have to be quickly absorbed as the Panzer arm was about to face a sterner enemy in the form of the French and British armies.

1. The motorised infantry regiment was detached from the 29th Motorised Division.
2. There were also 388 Panzers held in reserve. Broken down by type they were: 260 Panzer Is, 67 Panzer IIs, 11 Panzer IIIs, 11 Panzer IVs, 34 Panzer 35(t)s and 5 Panzer 38(t)s. These numbers include the independent Panzer battalions.
3. These numbers do not include the unarmed command tanks. There were a total of 134 available.
4. These were the 10th Mechanised and Warsaw Mechanised Brigades. The Warsaw Brigade fielded 43 tanks (26 TKSs, 17 Vickers). The 10th Mechanised had 231 tanks (13 TKs, 13 TKSs, 98 7TPs, 45 R-35s, 17 Vickers and 45 FT-17s).
5. *Kampfgruppen* Kleeman and Angern. Both were formed around the two Panzer regiments.
6. Initially the 2nd Panzer and 4th Light Divisions were under the command of the XVIII Corps from 1-2 September. This was a ploy to disguise the intended use of both corps from Polish intelligence.
7. Von Thoma became famous later in the war for his various commands in the North Africa.
8. The lone exception was the XIX Corps use of its motorised divisions throughout the campaign. This was likely due to Guderian's insistance.

A rest break in Poland gives the commander of this eight-wheeled SdKfz 263 the chance for a cigarette. The tools stowed on its front have first been painted grey and then the white cross painted over them. (Prigent Collection)

This 8-wheeled SdKfz 231 is very dirty but its grey and brown camouflage can still just be seen on the original print. Facing the viewer on the front mudguard is a version of the tactical sign for an armoured car unit, unfortunately covered in dust so impossible to read clearly. (Prigent Collection)

Captured vehicles were put into use. These TKS tankettes were captured by 6 Company of Infantry Regiment 76 on the morning of 12 September 1939 in Zareby-Boledy, 107 kilometres northeast of Warsaw, and photographed for a celebratory postcard. It still carries the Polish camouflage of horizontal bands in sand-grey, green and brown but the Regiment has chalked on its own markings. (Prigent Collection)

Not all Polish tanks were the famous 7TP series. This is a Vickers Mk E, still carrying its pre-1936 camouflage in fairly bright tones of sand, green and brown, captured in Schepetowka. (Prigent Collection)

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Terry J. Gander

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